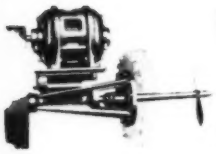
THE PAPER INDUSTRY
and PAPER WORLD
AN EDUCATIONAL NEWS MAGAZINE—DECEMBER, 1946

DETROIT

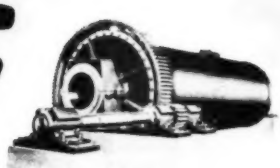
IN PAPER PRODUCTION IT'S

Patterson

for quality performance
at lower operating cost!



SATISFACTORY
PATTERSON
MACHINERY



THE PATTERSON FOUNDRY & MACHINE CO.
EAST LIVERPOOL, OHIO, U.S.A.
IN CANADA THE PATTERSON FOUNDRY & MACHINE CO. CANADA Ltd. TORONTO, ONTARIO

MISERLY WITH MOTION

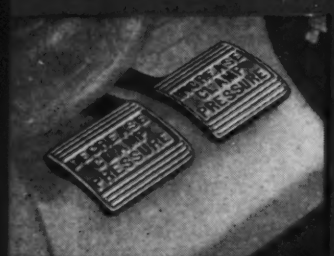
SIMPLE, QUICK KNIFE ADJUSTMENT: A turn of the knurled collar on pull bar adjusts knife to cutting stick. No tools are necessary. Self-locking. Adjusts to the thickness of one sheet.

Simple, quick knife adjustment is just on[e] more reason why mill trimmer and space[r] operators are saying of the new Seybol[d] "Sixty"—"that's the machine for me".

Recognizing that certain adjustment[s] such as changing clamping pressure an[d] resetting the knife, can never be elim[i]nated, these and other tasks have bee[n] greatly simplified. The efficient, new lin[e] of Seybold "Sixty" Mill Trimmers an[d] Spacers have been designed to conser[ve] the operator's time and energy by helpin[g] him to be miserly with motion. In the lon[g] run, this spells greater productivity . . [.] greater tonnage.

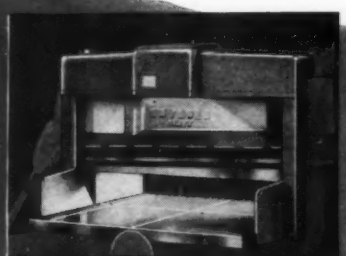
Today, Seybold Mill Trimmers an[d] Spacers are faster, safer and more accura[te] —are more efficiently lubricated and mai[n]tenance has all but disappeared.

Get all the facts from your Harris-Seybo[ld] representative.



CONTROLLED BY FOOT PEDALS: A simple pumping motion changes clamping pressure instantly. No tools are needed. Saves time. Saves energy. A shadow gauge registers the pressure reading.

EASILY LUBRICATED: Zerk fittings are provided for cleaner, easier, more permanent lubrication. Lubrication points are out in the open, encouraging more thorough lubrication.



FLOODLIGHTED TABLE AND GAUGE—MAGNIFIED MEASURING BAND: Less operator fatigue. Greater safety. Less chance for errors. Greater production of more accurately trimmed work.

FASTER AUTO-SPACERS: Auto[matically] moves stock into position at a rate than ever before. Cut stops set, at one time, to make all cut[s] sary on several jobs.

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HARRIS PRESSES • SEYBOLD MILL TRIMMERS AND AUTO-SPACERS • OTHER GRAPHIC ARTS EQUIPM

Woodshop Average: 150 Patterns a Day

Many are new patterns for new designs coming from Beloit drawing boards. On file are approximately 75,000 different patterns and 48,000 core boxes with their respective drawings. Patternmaker Marvin Hefti, here seen checking a pattern for a new motor bracket, has been with Beloit for 10 years, and is one of 260 returned servicemen currently employed by this company. *Beloit Iron Works, Beloit, Wisconsin.*

BELOIT IRON WORKS PAPER MACHINERY BELOIT, WIS., U.S.A.

WHEN YOU BUY BELOIT...YOU BUY MORE THAN A MACHINE!

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Can your Agitation be Improved?

Shrouded type propellers are used where a directed flow is required. They are especially suitable for chests which cannot be partitioned and for stocks of pumpable consistencies.

CHANCES are that substantial benefits in both performance and costs can be realized by modernizing your methods of agitation.

Proper agitation is under constant specialized study at Impco. This study has produced many varieties of agitator elements — single and multiple assemblies, vertical and horizontal assemblies of propellers, screws and sweeps for effective agitation of conventional and unusual stock chests.

Send a short outline of your problem. We will gladly develop preliminary layouts for discussion or submit a proposal.

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A-10

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Are you getting all the twine you need when you need it, at a reasonable price? If not, it will pay you to get in touch with us, as we can do these very things for you.

We can furnish any size, ply or put up.

Sample ball, for your inspection and trial, will be sent you, free of charge, upon request.

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- Sodium Sulfide
- Sodium Hyposulfite
- Sodium Sulfite (Anhydrous)
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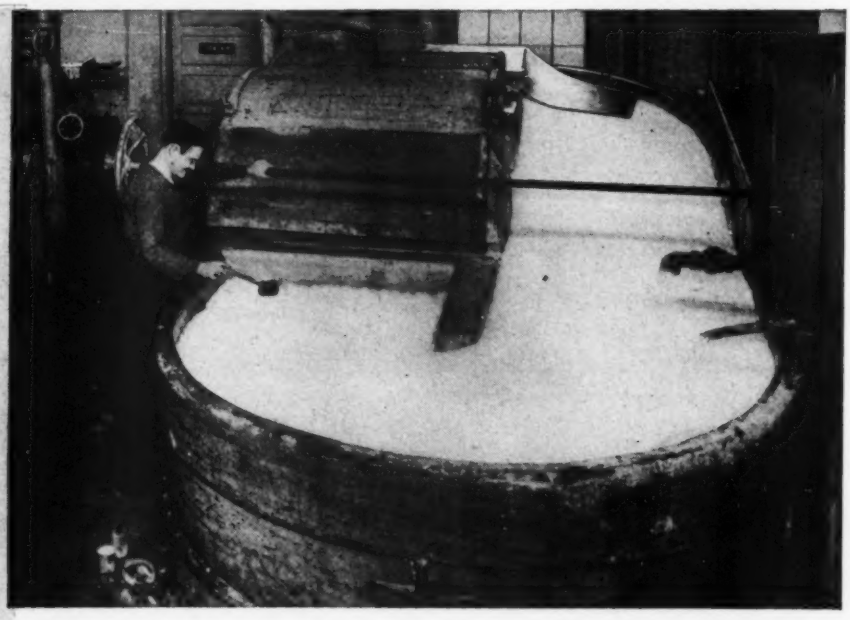
- Trisodium Phosphate
- Tetrasodium Pyrophosphate
- Sulfuric Acid
- Nitre Cake (Sodium Bisulfate)
- Nitric Acid

BASIC CHEMICALS
GENERAL CHEMICAL COMPANY
FOR AMERICAN INDUSTRY



Making quality paper depends to a large extent on the quality of the chemicals used. General Chemical Aluminum Sulfate, for example, either in the Standard or Iron Free grades, will help maintain quality in your paper from the start. General Chemical's carefully controlled production methods insure "Alum" of uniform quality and concentration, and a low percentage of impurities.

Next time, specify these quality General Chemical products for *your plant:*

ALUMINUM SULFATE

Standard—Lump, Ground 99% thru 8 mesh, 95% thru 10 mesh; Powdered, 95% thru 100 mesh.

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Solutions: from 38°—60° Baumé

Appearance: Opalescent to clear

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THE PAPER INDUSTRY and PAPER WORLD

(Reg. U. S. Pat. Off.)

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Need Digesters or Steel Plate Work?

We recently erected the 14-ft. diam. by 45-ft. sulphite digester shown above and at the right at a pulp mill in New York. It is of riveted construction. We also build sulphate and sulphite digesters of all-welded construction. Tanks and steel plate used in manufacturing processes at sulphite pulp mills often require corrosion-resistant alloys. We can furnish them with special linings when mill conditions require it. All three of our plants have facilities for x-raying and stress-relieving vessels in accordance with code requirements.

Whatever your steel plate work needs are, write our nearest office for quotations. All of the equipment we furnish to paper and pulp mills is designed and fabricated specifically for the job.

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WITHOUT fatigue, and all day long, *one man*, with an Aero-Crane, does the work of 4 or 5 men—gets your material onto the stockpile and out again at minimum cost. With the Aero-Crane one man handles 200 to 1000 lb. loads that eat up the time of a yard crew.

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Built in a range of eight models. Capacities of 3,500 to 60,000 lbs. at 12 foot radius. Diesel or gasoline powered.

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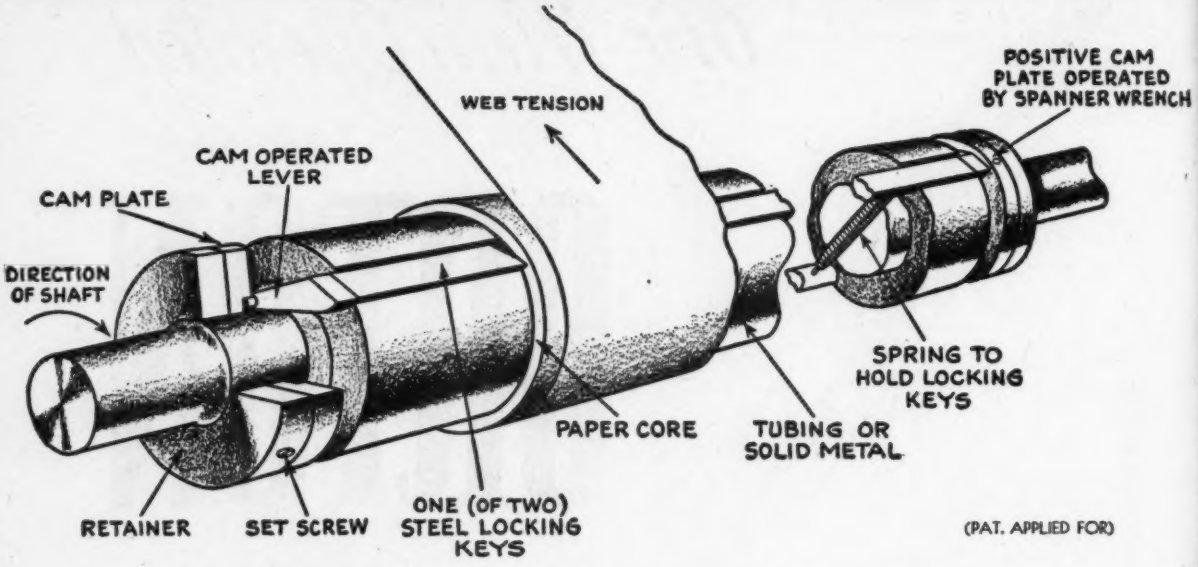

(PAT. APPLIED FOR)

The Collette Winder Shaft—TYPE D

- Steel keys lock core firmly on shaft
- Increase in tension raises locking pressure
- Body made of magnesium tube for lightness
- Weight is about one half pound per face inch
- Particularly popular for 3" I. D. cores
- Ideal for drum winders and slitters
- Can be used effectively on most shaft winders
- Suited for both winding and unwinding operations
- No collars, wedges or other loose pieces
- Winds hard, uniform rolls; no distorted cores
- Speeds assembly of cores, reduces worker fatigue
- Cost is reasonable and commensurate with quality

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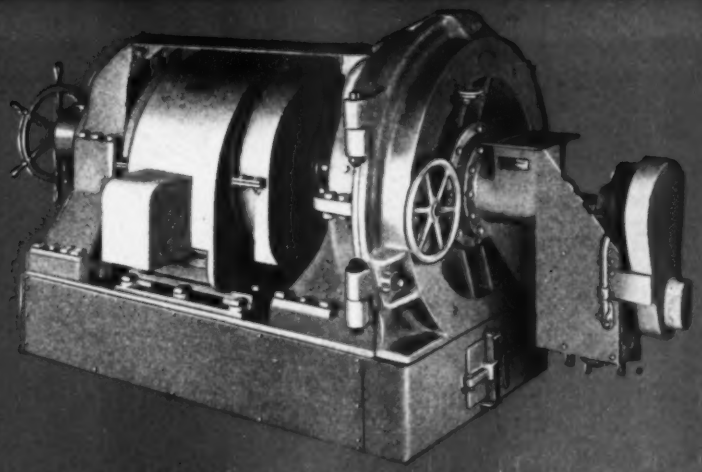

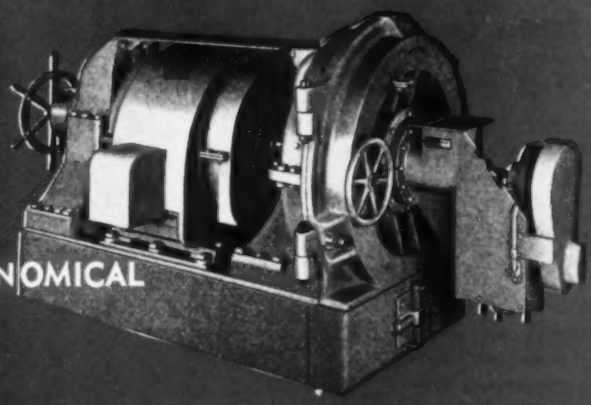

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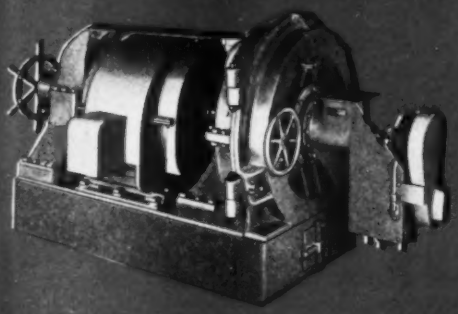
FICIENT and ECONOMICAL



Exceptionally versatile in its smooth power, the new, improved Sprout-Waldron 36-2 Refiner is capable of all operations from a straight defiberizing program to the actual refining of already processed fibers for fine papers.

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SPROUT-WALDRON & CO.

Manufacturing Engineers

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?
PROBLEMS
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It costs a lot of money to make any pump—especially if you want to be a leader, not a follower, and to build a pump so efficient, so dependable that it will be second to none.

You pay the expense of maintaining well-staffed laboratories for product investigation and research—for continuous search for high efficiencies, better applications—and for the thorough testing of your finished product.

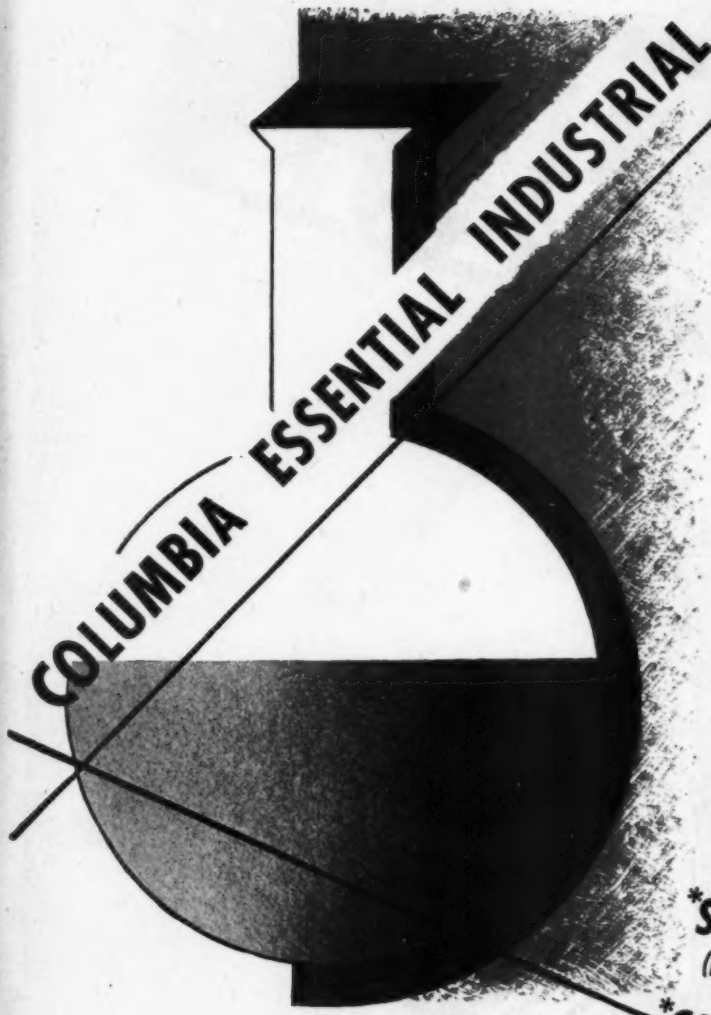
You pay the expense of providing production facilities and techniques; you pay for new materials, new methods which, with the cost-reducing benefits of mass production, assure your customers of greatest satisfaction.

Finally, you've the problem of making it easy for your customers to reach you for sales, service and consultation; you must network the country with distribution centers manned by experts.

Yes, all this costs a lot of money. No wonder, then, that there are so few pump manufacturers with this valued background. Among them, Fairbanks-Morse is an unquestioned leader in all phases of liquid-moving service . . . For all pumping problems, first see your Fairbanks-Morse dealer or call at the nearest Fairbanks-Morse branch office.

FAIRBANKS-MORSE

A name worth remembering



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*SILENE EF
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SODIUM BICARBONATE

*SODA BRIQUETTES
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(Precipitated Calcium Carbonate)

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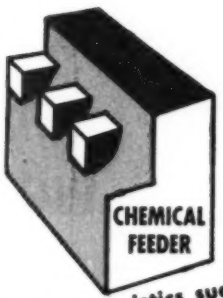
...That's BECCO HYDROGEN PEROXIDE

By far the most important use of hydrogen peroxide is its application as a bleaching agent. Commercial hydrogen peroxide solutions simply diluted with water to a suitable concentration, bleach almost any organic material.

FOR MOST ECONOMICAL USE special groundwood bleaching methods have been developed by BECCO. The amounts of hydrogen peroxide needed for bleaching are small, but the results obtained are outstanding. Some of these are:



1 **Substantially no loss in weight.**

2 **Retention of groundwood's desirable characteristics such as bulk, absorbency, strengths, and formation on the machine.**

3 **High brightness increases.**

Now is the time to investigate the use of Becco Hydrogen Peroxide for groundwood pulp bleaching. Write to:

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When you buy Midwest Welding Fittings, you get the same fittings that we use by the thousands in our own shop fabrication and field erection. So we can talk about pipe welding fittings "as one user to another."

We *know* that Midwest Welding Fittings save time in prefabricating piping . . . and in erecting piping in the field. Their sound design, dimensional accuracy and uniformity are features which are of definite help in making the job easier . . . in saving time and money . . . in providing better piping.

We *know* that the large variety of Midwest Fittings is another time and money saver . . . in addition to improving piping practice. We have reference to such Midwest developments as reducing elbows, "long tangent" elbows, shaped nipples, etc. See Bulletin WF-41 for complete information.

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A GREAT many household items are now being made of paper because of the advantage of wet strength imparted to paper by PAREZ Resin 607.

Durable wet-strength paper tablecloths and napkins... disposable sheets and pillow cases... towels ... handkerchiefs... window shades and drapes... these are only a few of the interesting possibilities in a new market being opened to paper manufacturers with wet-strength paper. For PAREZ Resin 607 provides not only high wet strength, but increased dry strength and fold endurance. Papers remain strong and difficult to tear even when soaking wet. They can also be handled many times without damage. Such qualities suggest many new uses for paper in the home, both as decorative and utilitarian items.

Improved wet and dry strength can be imparted to any type of paper from paperboard to fine tissue by PAREZ Resin 607. It is added during the regular paper manufacturing process efficiently and easily through use of Cyanamid's own procedure. Our technical service representatives will be glad to work with you.

WHEN PERFORMANCE COUNTS... CALL ON CYANAMID

AMERICAN Cyanamid COMPANY

Industrial Chemicals Division

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**Trade-mark of American Cyanamid Company covering its synthetic resins for use by the paper industry. The processes under which PAREZ is applied in the production of wet-strength paper are covered by U. S. Patents Nos. 2,291,079, 2,291,080 and 2,345,543 and U. S. Patent Application Serial No. 453,032.

Santa Is Back

CHRISTMASTIME has become a perennial that has bloomed around the earth each year since its beginning in Bethlehem. In times of prosperity or adversity, the beauty of Christmas and what it brought to the earth has cheered the hearts of people everywhere.

But the jolly big man in the red suit and whiskers is a tradition that typifies prosperity—he always comes loaded with gifts. This year Santa is really back again bringing to a close the first full year since the end of the war, and there is early evidence that his load of giving will reach a new high.

There are still many hurts that have not yet healed; many sorrows that have not given way completely to consolation. Then amid the cheer of the Holiday Season let us try to remember that Christmas is a time not only for giving gifts, but for spreading loving-kindness. And during those busy, merry days, let us pause in adoration for the real thought of Christmas and join that chorus of "hosannas" which grows stronger with each passing year.

TRADE WINDS

St. Regis Starts New Machine at Deferiet on 45th Anniversary

A new view of the Deferiet plant looking across the Black River. At the right is the new No. 6 paper machine building

▶▶▶ AN EPOCHAL EVENT in the history of the St. Regis Paper Company was the dinner given October 24 at the St. Regis Inn, Deferiet, New York. This occasion was in reality an anniversary, for it was forty-five years ago that the Deferiet plant, the first operating unit of the St. Regis organization was established. The original plant represented an investment of $2,000,000.

Another reason for recording this dinner is because it honored fifty-six employees of the company's mills at Carthage, Deferiet, Harrisville, Herrings, Norfolk, Oswego, and Watertown, New York. Roy K. Ferguson, president of the St. Regis Paper Company, attended the dinner and presented 25-year pins to this group of loyal people.

But the reason for this occasion which thrilled all members of the St. Regis organization—newcomers as well as old-timers—was the completion of the first stage of a $6,000,000 expansion program at the Deferiet plant which has enabled the company to boost its paper producing capacity at the mill more than one-third.

R. K. Ferguson, president of St. Regis Paper Company

At the testimonial dinner, Mr. Ferguson said that the installation of a 218-inch fourdrinier paper machine—one of the largest in the industry—has lifted the pulp and paper mill's annual production capacity from 80,000 to 110,000 tons.

The No. 6 machine, as the newly installed unit is known, was built by Bagley & Sewall Company, and, as its name implies, brings the number of machines now producing paper at Deferiet to six. It has a maximum speed of 1,100 feet per minute, with a trim of 204 inches.

Additional installations under the current program at Deferiet include a battery of the latest type Roberts

grinders, construction of a new power plant and electrical distribution system, as well as a new wood-handling building.

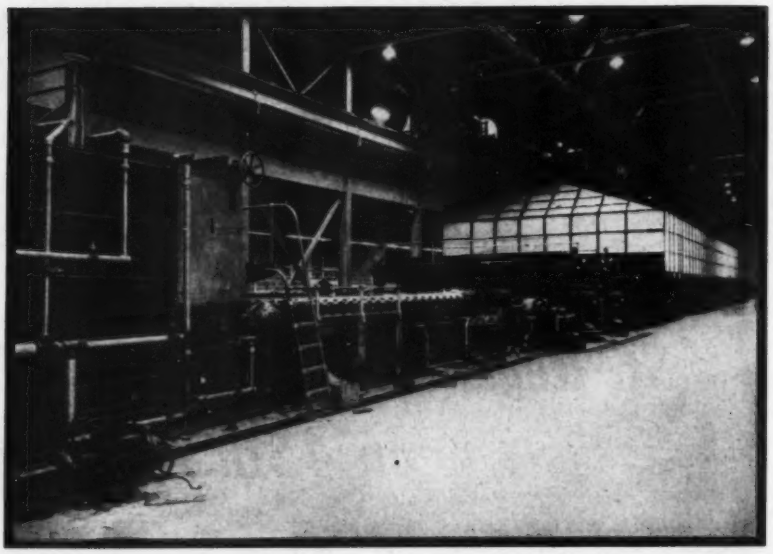
One of the main features in the sulphite mill expansion has been the installation of a new 14 x 45-foot digester fed by a new three-unit belt conveyor system. This digester has made available a total of four units which permit fully flexible pulping operations. In the groundwood mill, the work of replacing the battery of two-pocket grinders with the latest type Roberts grinders is nearing completion.

Now that the Deferiet plant has been built into one of the industry's largest and most closely integrated mills, the company will use any one or a combination of several local woods. Timberlands owned by St. Regis in New York State and New England total 350,000 acres. In Canada, the company owns more than 200,000 acres and controls another 100,000 acres under Crown leases.

The augmented and integrated wood supply, pulp and papermaking capacity will be used in the production of magazine and printing papers, made from peroxide-bleached groundwood pulp, giving good capacity and smoothness, and from long-fibered sulphite pulp which provides added strength.

The peroxide-bleached groundwood pulp that will be used in these papers is a new development which represents a great step in the perfection of an ideal base pulp for this class of printing papers. This process was developed during seven years of research by DuPont scientists and was adapted to large volume production for the first time in collaboration with St. Regis paper technicians.

The excellent printing characteristics of the lightweight bleached groundwood paper permit the use of this stock to replace other types, used for rotogravure, book magazine, catalogue and directory printings, as well as for mimeo, tablet and communications forms. Other advantages of this type of paper are brightness, cleanliness, capacity, and absorbency.



The new No. 6 paper machine which was placed in operation recently. It is calculated that this machine will increase the output of the Deferiet plant by 37½ per cent

Looking back over nearly a half-century of the company's progress, Mr. Ferguson told employees that since completion of the original $2,000,000 project at Deferiet in October, 1901, production capacity at that mill has been stepped up from a daily average of 90 tons to the present 350 tons.

"Fostered by devoted service," Mr. Ferguson said, "the St. Regis organization has grown in size, scope of operations, and industrial prestige until it is now one of the world's leading producers of pulp, paper, multiwall bags and laminated plastics. With forest tracts, pulp and paper mills, and a score of converting plants spread across the continent from Oswego to Tacoma, from Deferiet to Pensacola, from Montreal to Vancouver, together with extensive bag manufacturing interests in South America, Europe, Australia, and the Far East, we have carried the manufacture, conversion and sale of wood cellulose products to the four corners of the earth."

To help carry on this long-range expansion program, St. Regis stockholders have approved changes in the company's financial structure designed to increase the authorized capital stock through the issue of 250,000 shares of new first preferred stock, par value $100. This action increased the authorized capital of the company to $72,027,070.

In June, of this year, St. Regis acquired the Florida Pulp and and Paper Company, Pensacola, Florida, and obtained an equity in the Alabama Pulp and Paper Company (Atmore, Alabama), adjacent thereto, marking the company's entry into the kraft pulp and paper industry in the South.

In Trenton, New Jersey, site of the Panelyte plastics division, a $2,000,000 building program made possible the addition of more floor space and a modern fabricating plant.

Within the past year, St. Regis purchased from Time Inc., the Bryant Paper Company, Kalamazoo, Michigan; the Hennepin Paper Company, Little Falls, Minnesota; and the Maine Seaboard Paper Company, Bucksport, Main (Cf. P.I. and P.W. Oct. 1946). Previous to acquiring these mills, St. Regis had operated them for Time Inc. under managerial arrangements.

Other purchases by the company

An aerial view of the entire Deferiet plant of St. Regis Paper Company

PAPER · · · America's 6th Industry

FACIAL TISSUES FOR AUTO WINDSHIELDS

(NOTE: *A leading chain of service stations is using paper polishing cloths in place of cotton rags.*)

Specially-treated tissues that leave no lint are being used to polish automobile windshields. Because of added tensile and folding strength, these soft paper polishing cloths can stand up under punishment until fully saturated; take the place of two or three ordinary paper towels. Paper "wipe" is equally serviceable, wet or dry. Costs less than cloth, and requires less storage space.

This new development in paper-making is fully described in a 12-page book entitled "Windshield Wiping Service" which is yours for the asking.

Paper dust cloths . . . paper dish rags . . . paper sheets and pillow cases . . . New uses for paper calling for new standards of lightness and toughness, new standards of quality in performance. New responsibilities—new opportunities for the Pulp and Paper Industry.

The Puseyjones Organization is now devoting itself completely to the design and construction of Paper-Making Machinery built to new high standards of speed and efficiency, and to the modernization of existing machines.

Among the new machines under construction by Puseyjones are three of the largest and fastest Fourdrinier Machines, one for book and high grade printing papers, one for white paper for bags, and one for Kraft liner board; also one Cylinder machine of record size and speed for the manufacture of floor covering felt. Other machines are under construction for the manufacture of M. G. Kraft specialties, facial tissues, and high grade bristols.

Puseyjones Engineers will welcome the opportunity to work with you in solving production problems.

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
Wilmington 99, Delaware, U. S. A.

THE SIGN OF TRADE MARK SUPERIOR QUALITY

The chemical unit in the modern research-development laboratory of the Kimberly-Clark Corporation. This is the largest single unit in the new laboratory

during the past year include the Nashua River Paper Company, East Pepperell, Massachusetts; and the Watab Paper Company, Sartell, Minnesota.

Speaking before the Rotary Club in Pensacola, Florida on November 12, President Roy K. Ferguson outlined the vast resources of the South. He also expanded upon the company's prospects for the manufacture of multiwall paper bags, made possible through a planned program of expansion at the Florida properties. Mr. Ferguson, accompanied by the company's executive staff from New York, spoke before the Rotarians in connection with the first official visit of St. Regis representatives following the merger of St. Regis and Florida Pulp and Paper Company interests. In perspective, Mr. Ferguson said, as part of his address:

"This new consolidation of operations between the Florida Pulp and Paper Company and the St. Regis Paper Company is in no sense a mere piece of financial or promotional engineering. On the contrary, it is a straight, realistic step in the joining of management, facilities for the production and conversion of kraft paper, and other resources which will unquestionably strengthen both organizations.

"It seems to me not mere sentiment that makes us all rejoice in this further knitting of industrial ties between the North and South . . . We need what you have in the way of abundant forests and productive facilities, while you will profit by the wider range and scope of the markets we bring to you. It is such tie-ups, so productive for both partners, that help knit our whole national economy into a more consolidated, more effective American civilization. So the kind of industrial treaty we have signed here spells progress for everybody concerned, and if there is a place for sentiment in it, it is at least a broadly based kind of patriotic sentiment of which we need never be ashamed. For such intersectional alliances go a long way toward building one America, as the United Nations is trying, in the face of vaster difficulties and misunderstandings than ever separated our South and North, to build one world."

◆

K-C CONVERTS OLD NEENAH MILL INTO RESEARCH AND DEVELOPMENT LABORATORY

One of the most outstanding examples of modernization in the paper industry is the conversion of the old Neenah (Wis.) mill into a modern research and development laboratory by the Kimberly-Clark Corporation.

This new center of product control, manned by a staff of experts, will coordinate the work of all divisions and maintain a standard of production with the absolute minimum of variation. The new laboratory, however, is not the company's entire technical operation. Day-to-day application of testing is carried on in the company's various mills.

When in full operation, the facilities of this new laboratory will provide a centralized location for 160 scientists, research and development personnel.

The laboratory unit, which comprises 66,000 square feet, has been only about half improved to date. The largest single area in the plant is the chemical laboratory.

Not completely finished, the first floor is one of the six separate areas, and houses mostly labs and storage rooms.

The second floor accommodates an essential pilot plant. Here also is located the technical library, conference room, and creped wadding customer acceptance laboratory.

On the third floor are the physics research rooms, chemical development rooms, printing laboratory, routine testing rooms, medical development sections and general offices.

Although the other 50 per cent of the mill proper has not been improved, the area is in use.

Throughout the finished areas, the most modern materials have been used and the finest equipment installed. The flooring is of asphalt tile in gray and tan; the walls are fire resistant Transite board. Recessed fluorescent lighting has been installed in most of the areas. All of the interior finishing is in modern blondined oak and natural birch. About 1,000 sprinkler heads protect the building against fire.

On November 1, the company held open house and employees were taken on a tour of the laboratory—company officials went through it shortly before that.

Heading the new unit is H. A. Rothschild, technical director, with J. B. Catlin, assistant technical director. Constituting the development staff are: L. C. Fleck, pulp; J. J. Shipman, paper; J. C. Bletzinger, crepe wadding finishing; E. H. Voigtman, creped wadding manufacture; K. A. Craig, plastic.

Immediately following V-J Day, Kimberly-Clark went about its reconversion by starting off with this new housing for research and development. The new quarters for its technical control operations marked the company's change-over from war work to peacetime production.

◆

PARKER-YOUNG MILLS ARE ACQUIRED BY MARCALUS CO.

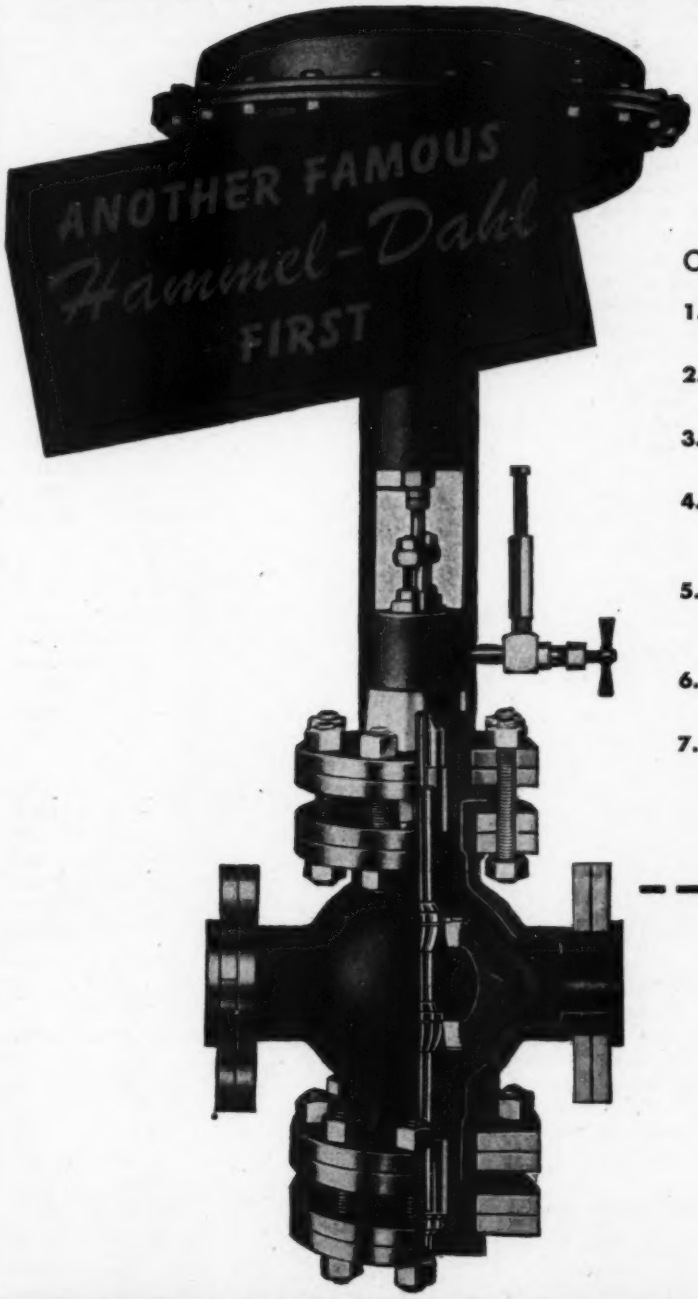
Purchase of the Parker-Young Company, Lincoln, New Hampshire, together with its pulp and paper mills in Lincoln and Livermore Falls, by the Marcalus Manufacturing Company, East Paterson, New Jersey, has been announced.

For the present, business will be carried on as usual, and complete liquidation of the Parker-Young Company will not be carried out immediately since it has larger property holdings in New Hampshire. The Marcalus company has agreed to serve the regular customers of the Parker-Young organization under a plan based on percentage of output.

Other operations of the Marcalus company are located in New Jersey, Chicago, and California.

AUTOMATIC CONTROL EQUIPMENT

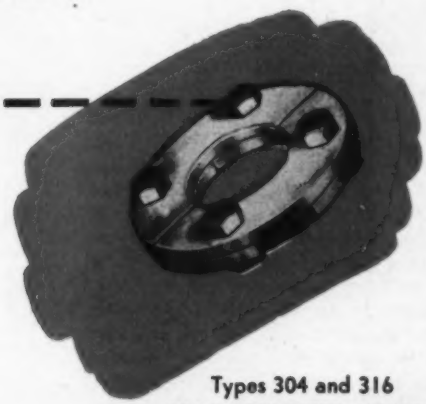
ENGINEERED DESIGN BY HAMMEL-DAHL



THIS VALVE DESIGNED *for the* PAPER AND PULP INDUSTRY

Hammel-Dahl Steel SPLIT-LAP Flange Construction has the following advantages:

1. Stronger, denser, stress free valve body castings are obtained by uniform wall thickness.
2. Bodies can be fabricated of any type Stainless Steel as well as any alloy that can be cast.
3. Barstock bonnets and blind head flanges are Standard construction.
4. Simplifies piping, as Van Stone split-lap type flange can be rotated to match bolt holes in pre-fabricated piping.
5. Body wall thickness is 600# A. S. A. Standard, but interchangeable flanges of 150#, 300# or 600# are supplied.
6. Stock valves have 300# A. S. A. Standard face to face dimensions.
7. ALLSTEEL Superstructure Standard construction, of course.



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A.P.P.A. COMMENT ON EXPRESSION FROM OVERALL ADVISORY COMMITTEE (OPA)

EDITOR'S NOTE: Commenting on the price situation, E. W. Tinker, executive secretary of the American Paper and Pulp Association, sent a letter to paper and pulp manufacturers under date of November 12, 1946. His letter is reproduced here.

With pulpwood, pulp, paper and paper products free from price controls, the responsibility is placed upon the individual units without the industry to determine policies that will stand the test of time. It is to be hoped that in establishing these policies appropriate consideration will be given to their effect on the national economy and on the industry.

I am quoting below from a letter, dated October 30, which was transmitted to the Office of Price Administration by the Overall OPA Advisory Committee for Pulp, Paper and Paper Products:

"* * * * * * *One question remains: would the pulp, paper and paperboard industry, if given free rein, take advantage of the opportunity and charge 'what the traffic would bear' irrespective of the relation of the prices of its commodities to those of other industries or to a reasonable profit? Fear or suspicion that decontrol might leave the consumer at the mercy of a rapacious industry must be in the final analysis the only reason for failure to order immediate decontrol.*

"We are sincerely and most earnestly of the opinion that any such fear or suspicion is groundless. We do not say that, in an industry comprising over 700 mills, large, medium sized and small, a producer would never be tempted to and would not take advantage of a buyer's importunities and sell a particular order or even a series of orders at unreasonably high prices. But we are convinced that any such action would be a rare exception—so rare that it would have no real import in the general picture. We are convinced that the great majority of the producers would follow no such course. They would welcome the opportunity to restore an orderly production schedule and in doing so would establish an industry pattern which none could safely ignore. This would mean the resumption of production of the low end items to the benefit of the user of the industry's products. We can never over-emphasize that, as a service industry, the most effective service the industry can render its customers is to give them the lowest priced product which will adequately serve their needs. Intelligent selfishness dictates that any industry shall satisfy its customers and our industry is not so unintelligent that it cannot and will not recognize the way to its own best interests."

The pulp and paper industry, as one of the major industries of the country, can, I think, in the main be depended upon not to take advantage of a situation which at best will be of temporary character. The considered and judicial statement of the Overall OPA Advisory Committee, with the demise of OPA, now means little in official circles. However, there is no doubt that the actions of the new Congress will be influenced to a considerable degree by public opinion which in turn will reflect the viewpoint of consumers towards price movements, particularly in major industries.

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PRICES DECONTROLLED—WOOD-PULP SUBSIDIES ENDED

● A presidential decree on November 9 removed price control from pulp, paper and paperboard. Since that date, many price adjustments have been announced, and more will follow. Any prognostications on this subject would be highly speculative. It is inevitable, of course, that industry will return to a normal state of activity. With this confidence is the hope that the way will not be too rugged. A close co-ordination of all organization is more vital now than at any time, and it is believed all mills in the industry will stand by in this crisis and support any measures proposed to bring all of its activities back to a basis of sound economy.

Simultaneously with price decontrol, the RFC terminated wood-pulp subsidies. The following pulp prices have been received as this issue closes. Prices are nominal; they are ex dock and f.o.b. pulp mills. (See Current Market Quotations in this issue for many other new prices.)

	Per ton
Foreign bleached sulphite	$105.00 to $120.00
Domestic bleached suphite	105.00 to 115.00
Foreign unbleached sulphite, prime strong	90.00 to 95.00
Foreign easy bleaching sulphite, prime	95.00 to 100.00
Domestic unbleached sulphite, No. 1 strong	85.00 to 95.00
Kraft, standard prime Swedish	90.00 to 95.00
Kraft, bleached, foreign	105.00 to 110.00
Kraft, No. 1 domestic unbleached	90.00 to 95.00
Kraft, southern, delivered	85.00 to 90.00
Kraft, bleached, domestic	100.00 to 110.00
Sulphite screenings, domestic	50.00 to 55.00
Sulphate screenings, domestic	45.00 to 50.00
Soda, bleached, No. 1, delivered paper mills	95.00 to 100.00

LOOKING AT THE NATION'S PULPWOOD SUPPLY

This article was released November 18, 1946, by the U. S. Department of Commerce, Washington, D. C.

▶▶▶ PULPWOOD PROCUREMENT for the country as a whole, both domestic and imported, is at a higher level than ever before, and there is every indication that receipts for the full year, barring interruptions of a serious and widespread nature, will reach a record figure of approximately 18.5 million cords.

Virtually all of the nation's paper mills, except a few in the Pacific Northwest, report adequate supplies of pulpwood on hand to carry them through the winter months at full capacity production, according to the November Industry Report on Pulp and Paper Production, prepared by the Pulp and Paper Unit, Office of Domestic Commerce.

Following is a summary of the current position of the pulp and paper industry:

Wood pulp—The high level of domestic wood pulp production continued to be maintained through October. The rate of increase over 1945, which has accelerated slightly during the past three months, gives reasonable assurance that production for the full year 1946 will approximate the 10½ million tons mentioned in the October industry report. Whether this figure—the highest on record apart from the year 1942—is definitely reached or not, production in 1946 represents a noteworthy effort on the part of the pulp industry to supply the unusual and sustained raw material requirements of the nation's paper and paperboard manufacturers.

Wastepaper—The market for wastepaper continues firm with virtually all grades in strong demand as mills

THE JACKSON LABORATORY . . . where Du Pont Dyestuff Research is carried on. Full attention is again concentrated on peacetime studies.

Bring your coloring problems to Du Pont. E. I. du Pont de Nemours & Co. (Inc.), Dyestuffs Division, Wilmington 98, Delaware.

Du Pont Dyestuffs

DU PONT

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

endeavor further to strengthen their inventories against the usual seasonal decline in collections and the increasing possibilities of inadequate supplies of wood pulp.

Field observers of the Department of Commerce report a fairly satisfactory wastepaper situation with collections remaining on the same high level as that of the past several months. Some items, in particular the higher grades, are in limited supply and news stock, despite the recent increase of newsprint consumption in important centers such as New York City, is in barely sufficient supply to meet the demand. Receipts of wastepaper for the nine months of 1946 were 7 per cent larger than for the comparable period of 1945.

Manufacturers—Although mills in all parts of the country are reported operating at capacity, paper production is still lagging behind consumption requirements, and shortages in some grades such as kraft wrapping paper, are worse than in August. Total paper and board production during September was below the August figure because of three fewer working days in September. Daily average production in September was 66,593 tons as compared with 62,404 tons in August.

Newsprint—The newsprint supply situation remains tight. Since January 1, considerable production capacity has been shifted from newsprint to other types of paper. It is estimated that by January 1, 1947, about 168,000 tons of capacity will have been thus shifted from newsprint production. New production scheduled in the United States will not be in a position to make good this loss much before the end of 1947. While Canadian production in 1947 may be expanded, the United Kingdom can be expected to take an additional 100,000 long tons of newsprint from North American mills during 1947. North American newsprint production during September dropped 12 per cent below the August volume because of the fewer working days, but was 18 per cent higher than the output for September, 1945. North American production for the first nine months of 1946 exceeded that of the corresponding period of 1945 by 24 per cent, due chiefly to increased activity of Canadian mills.

Newsprint consumption in the United States continues high. Estimates for September show a rise of 3 per cent over August and of 26 per cent over September, 1945. Consumption during the first nine months of 1946 is estimated at 3,188,000 tons, an increase of 690,000 tons (or 28 per cent) over the corresponding month last year. Publishers' stocks dropped about 2 per cent in volume during September, and at the end of the month were only 4 per cent lower in volume than at the end of September, 1945. Owing to the higher rate of consumption this year, stocks held by the publishers at the end of September represented only 34 days supply, compared with 37 days supply at the end of August and 44 days supply at the end of September, 1945.

Groundwood printing, book and fine papers—Requirements for these papers continue to run ahead of available supplies. The shortage is particularly acute for book papers and for all types of the cheaper grades. Mills are thirty to sixty days behind on deliveries while jobbers' stocks consist chiefly of slow moving items. Production during September was 15 to 30 per cent above that of September, 1945. As compared with August, however, the output of groundwood and fine papers declined 10 per cent, and book papers 6 per cent, because of the fewer working days.

Coarse papers—The demand for coarse papers continues heavy, and the supply during October was shorter than in the previous month. Dealers in some sections of the country have exhausted their supply of kraft paper. Production of coarse papers in September, 1946, was 17,639 tons less than in August, because of three less working days, but the daily average production for September was 9,283 tons compared with 8,905 tons in August.

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SEVENTEEN NATIONS TO PARTICIPATE IN TARIFF REDUCTION NEGOTIATIONS

Seventeen nations will actively begin multilateral tariff reduction negotiations at Geneva, Switzerland, April 8. This was decided at the London conference of the Preliminary Commission to formulate plans for a United Nations social and economic organization. Before the international trade organization is set up, however, it is planned for the seventeen nations which have accepted the United States offer to participate in tariff negotiations to secure separate authority from their heads of state to conclude such negotiations.

This procedure has been anticipated by the United States State Department which has issued a list of several thousand items on which it is willing to negotiate tariff reductions. This list includes practically every grade of paper, sulphite and kraft wrapping being omitted for the time, as the principal suppliers of these grades are not participating in the present conferences.

American industry has until December 21 to file briefs in objection to the duty cut proposals, and oral hearings will start at Washington Jan. 13. The April 8 international conference will conclude the program.

The Preliminary Commission concluded its sessions at London November 26 with the announcement of the further plans as indicated.

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BRITISH PAPER NOTES (October, 1946)

▶▶▶ As anticipated the stepping up of the paper quotas to the periodicals and trade journals during the new license period has presented a real problem to British paper producers. It is expected that there will be slightly increased production of mechanical papers, and with the receipt of fair quantities of esparto grass from Africa, the amount of esparto papers available will be slightly higher. The esparto papers are in fact the main hope of general paper consumers at the moment. Unfortunately there is one drawback to the use of this grass; the cost of the raw material is so high and with control prices for the finished paper as they are it is possible that papermakers are reluctant to use esparto.

It would appear that the possible increased production of mechanical and esparto paper will be insufficient to cover the extra tonnage required since a fairly large proportion of the publications and trade journals do not use mechanical or esparto grades but are mostly printed on the coated or wood qualities. Added to this, certain factors such as poor quality coal and lack of machinery or replacements for old machinery are tending toward a lowering of production. Consequently it has come as a shock to the paper merchants to be informed that their supplies of general printing and writing papers will be cut by 10 to 20 per cent during the next four months. Also, news has been received from at least one large producer that greater efforts are to be made to increase exports.

Despite the fact that exports of paper and boards have steadily mounted during the earlier months of this year there would appear to be a certain uneasiness on the part of the British papermakers concerning these exports. The announcement by Cabinet Minister that exports generally during the third quarter of this year have reached 110 per cent of prewar is not altogether surprising when dealing with a commodity starved world. This

300% MORE BLACK LIQUOR EVAPORATOR SERVICE with Timken 5% Nickel Alloy Steel Seamless Tubes

For the more severe (concentrated) effects in black liquor evaporator service a recent Timken survey and analysis showed that Timken 5% nickel steel has established a record average of 4 times the service usually received from carbon steels lasting only eight to twelve months.

In addition to increasing tube life an average of four times over, Timken 5% nickel alloy steel seamless tubes assure longer service from the tube sheets themselves — thus decreasing evaporator down time losses as well as replacement costs considerably.

Manufacturers of black liquor evaporators and mill maintenance and replacement engineers can profit greatly by calling on Timken specialists for specific recommendations—for no other steel producer has such a background of research knowledge and experience of high temperature applications. And no other can offer such a wide choice of steels of such uniformly high quality for specific high temperature problems. Only the most precise production control practices known to the steel industry through every step of every operation from melting the steel to the finished tubing, and all within the one organization can achieve these results.

Get our recommendations — write Steel and Tube Division, The Timken Roller Bearing Company, Canton 6, Ohio.

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SPECIALISTS in hot rolled and cold finished Alloy Steels Bars for forging and machining applications, as well as a complete range of Stainless, Graphitic and Standard Tool Steel analyses. Also Alloy and Stainless Seamless Steel Tubing for mechanical and pressure tube applications.

supposedly healthy state of affairs does not apply to the paper trade which for September, the second month in succession, disclosed a drop in exports.

The present volume of exports will not be easy to maintain as world production moves towards more equitable consumption. This seems to be the opinion held by North America, otherwise Sir Walter Layton, chairman of the rationing committee of the Newsprint Supply Company, would not have such an optimistic report to offer. According to this authority Canada and Newfoundland will increase exports of newsprint to Britain from 50,000 long tons at the present time to 150,000 long tons and he expressed the hope that by 1950 North American exports would reach the prewar figure of 450,000 tons (actually according to the Board of Trade Returns this figure was 325,069 tons).

Although it appears impossible, viewing the present world conditions of the paper trade, for supplies to equal consumption within a period of several years, one is led to wonder by these efforts to peer into the future whether, after all, the experience of 1920 might not be repeated. At that time it will be recalled the authorities of the trade were predicting that the paper boom would last another five years. Today the same opinion is expressed but as far as the British paper trade was concerned the boom disappeared completely at the end of 1920. It would be a brave person indeed who would dare to predict that the present position might not be considerably altered by the end of next year.

Just one report of many which have recently been published is worthy of more than a moments reflection. Canadian production of newsprint during August this year was 370,676 tons, an increase of 56.4 per cent over August 1939, and within the next two or three years Canadian mills expect to increase production by 250,000 tons annually if demand remains stable.

Yet we recollect that just before the war the British paper trade was very much concerned by the decision on the part of the Scandinavian pulp makers to reduce pulp production by 25 per cent in order to bring paper production down to the then estimated demand. At the moment the Scandinavian mills are providing the British paper trade with 50 per cent of three-quarters of the prewar amount.

Sir Walter Layton mentions that the prewar consumption of newsprint in Great Britain was 1,250,000 tons, and he considers that two million tons will eventually be needed to meet present increased demand or in other words the potential demand is 62½ per cent above prewar.

It is difficult for the uninitiated to understand these estimates particularly in view of the fact that prewar consumption covered sufficient newspapers to meet the nation's need and these newspapers were composed of 16 to 30 pages. Today we have to be contented with six pages every other day, therefore by the estimate of two million tons potential circulation may be assumed to have risen by several hundred per cent. This has not proved to be the case since newspaper circulation was freed on September 25. The numbers of copies sold has certainly risen but probably 20 per cent would more than cover this advance, and, at present, Great Britain is consuming about 400,000 tons of newsprint which with the 20 per cent would make only 480,000 tons.

Our purpose in making this point is that when estimates of this sort are made by authorities and when Sir Eric Bowater's recent remark is recalled that if newsprint sales declined by 20 per cent newsprint would still be in sellers market, we suggest that it behooves the ordinary papermaker and merchant to study the future with the greatest of care.

Meanwhile the latest Board of Trade returns which cover the nine months of this year disclose that Great Britain has received 216,011 tons of imported paper and boards compared with 803,029 tons for the same period of 1938. Exports have reached 78,153 tons against 132,331 tons during January-September 1938, and material imports are quoted at 216,011 tons and 803,029 tons respectively.

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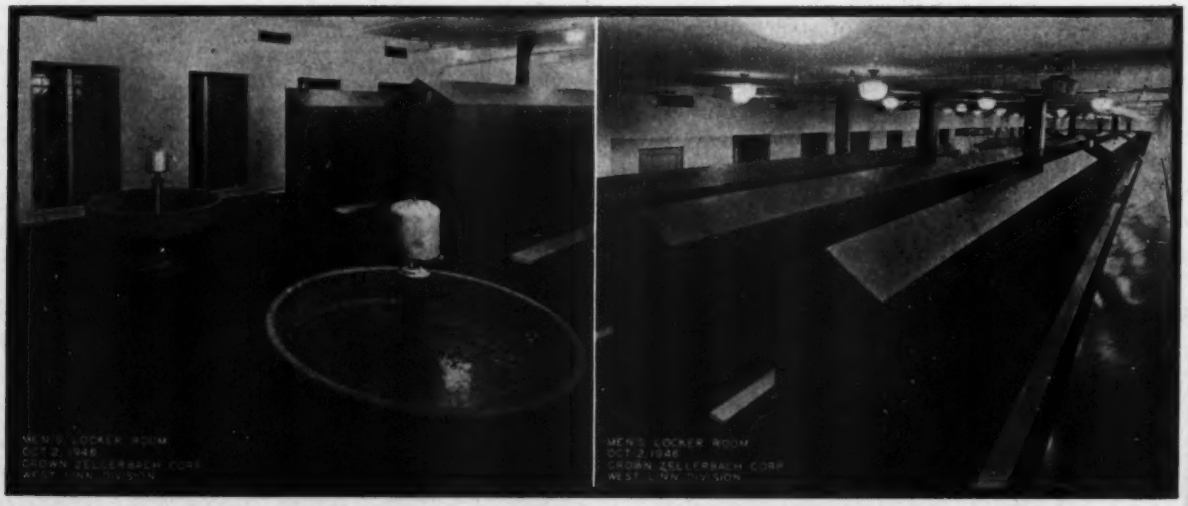
PLASTIC CRUISER

Plastic from the Consolidated Water Power and Paper Company was used recently in building a 19-foot outboard cabin cruiser, believed to be the first of such size made almost wholly of impregnated paper. The boat was built by the Schneider Boat Company, Milwaukee, for Evinrude Motors, Milwaukee division of the Outboard, Marine and Manufacturing Company.

The plastic is of a type used in wartime for aircraft. While not lightweight in itself, it may be used in thin sizes because of its strength, and can be used either alone or in combination with plywood or wood cores to give it greater rigidity. When used as a



Work has been completed on the men's locker room at the West Linn, Oregon, plant of Crown Zellerbach Corporation. An extensive modernization program at this plant is now in progress. The locker room occupies 8,700 square feet of space and contains 735 lockers, 10 double showers and four wash fountains

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boat deck it is given a mesh surface.

In the Milwaukee-built cruiser, the cored form was used in thicknesses of ¼ inch for bottom and sides, ½ inch for bulkheads, ⅛ inch for the cabin roof, and ⅞ inch for the transom to support the motor. The entire boat weighs about 900 pounds, more than 50 per cent less than a solid wood boat.

The cruiser is said to be fully waterproof and does not shrink or swell. The only wood used was that for the framework. Joints are screwed and glued with waterproof glue. A number of smaller boats have been built of plastic and are said to have proved highly durable.

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FINANCIAL

Despite various advances and recessions on industrial securities due to the end of OPA and the coal strike, paper mill stocks remained steady during November, with little change at the end of the month.

American Writing Paper Corporation—Reports for September quarter a net profit of $42,305, or 11 cents a share, compared with $28,582, or 8 cents a share last year. Net profit for first nine months of 1946 was $164,365 as against $108,017 a year ago.

Certain-teed Products Corporation—Net income for nine months was $2,759,528 as against $694,364 for the same period a year ago.

Container Corporation of America—Net profit for the first nine months of 1946 was $4,803,108 as against $1,301,962 for the same period in 1945.

Eastern Corporation—Net income for nine months was $2,811,756 as against $2,502,839 for the same period in 1945.

Robert Gair Company—Net profit for nine months was $1,728,191 as against $532,932 a year ago.

Great Northern Paper Company and Wholly Owned Subsidiaries—report a net profit for nine months of $1,607,257, or $1.61 a share, compared with $851,707, or 85 cents a year ago.

International Paper Company—Net profit for nine months ending September 30, was $21,252,904 as against $7,283,592 for the same period in 1945. The 1946 figures, however, include $613,640 from cancellation of provisions during the first six months to convert foreign holdings to U. S. dollar equivalents. It also includes earnings from foreign properties.

Kimberly-Clark Corporation—Net income for nine months was $2,789,338 compared with $1,917,979 a year ago.

Minnesota & Ontario Paper Company—Nine months net income was $1,125,490 as compared with $989,780 a year ago.

Nekoosa-Edwards Paper Company—Net income for nine months was $707,712 as against $382,385 a year ago.

Paraffine Companies, Inc.—Net sales of $14,472,235 reported for the fiscal year ended June 30, and were 46 per cent below the total of $26,702,794 for the previous record breaking year.

Puget Sound Pulp & Timber Company—Net income for nine months ended September 30 was $784,622 as against $326,585 the previous year.

St. Regis Paper Company—Net earnings for the first nine months of 1946 were $3,914,052 as against $2,545,448 for the same period last year.

Scott Paper Company—Nine months net income was $1,160,594 as against $1,079,905 a year ago.

Soundview Pulp Company—Reports for nine months a net income of $1,325,138, equal to $2.52 each on 488,250 common shares, compared with $613,604, or $1.06 a share last year.

Sutherland Paper Company—Net income for nine months was $1,144,762 as against $368,709 a year ago.

Union Bag & Paper Corporation—Net income for nine months, was $3,643,599 as against $1,472,954 a year ago.

United Wall Paper, Inc.—Net sales of the company and its domestic subsidiaries for the first fiscal quarter ended September 30, 1946, totaled $3,662,000. Net profit after taxes was $478,000.

West Virginia Pulp & Paper Company—Net profit for six months was $2,300,173 as against $1,145,873 a year ago. In addition to this operating profit, the company reports a net credit to surplus of $1,251,845 from the sale of mature timber.

Stock Floatations and Ownership Changes

The Brown Company, Berlin, New Hampshire, has refunded an R.F.C. loan of $4,257,495 through a $6,500,000 loan by a group of New England banks on a first mortgage. The loan will permit the completion of an expansion program.

Kimberly-Clark Corporation, Neenah, Wisconsin, has registered with the SEC 70,000 shares of $100 par four per cent cumulative convertible second preferred stock to be offered to the public. Net proceeds will be added to the firm's general funds and used to finance additional plants and facilities of the company and its subsidiaries.

The Morris Paper Mills, Chicago, Illinois, is offering 29,126 shares of 4¾% cumulative preferred and 55,000 shares of common stock, with par value of $50 and $10 respectively through an underwriting group. The securities are being sold for the account of individual holders.

Hinsdale Paper Manufacturing Company, Hinsdale, New Hampshire, has been sold by Fred R. Graham of the Graham Manufacturing Company, and associates, to Isadore Baum and members of Mr. Baum's family. Mr. Baum says there will be no change in personnel or policy.

Perkins Goodwin Company, New York, New York—Interests identified with this company have purchased control of the Ryegate Paper Company, East Ryegate, Vermont. The mill makes groundwood specialties.

New York Stock Exchange—Stocks

	Closing Prices Nov. 25	Oct. 25
A.P.W. Products	*4¾–5	5
Celotex	24½	25⅞
Same Preferred	20¾	20⅝
Certain-teed Prod.	17	17¾
Champion P&F Co.	*23–24	24½
Same Preferred	110	109½
Container Corp.	42¾	41¼
Cont. Diamond	8¾	9¼
Crown Zellerbach	27⅞	28
Same Preferred	*105–105½	106⅜
Same $4 Pref.	*116–122	*116–118
Dixie Vortex	*29–29¾	31⅜
Same "A"	54	53
Robert Gair Co.	8¼	8¼
Same Preferred	20	19¼
Gaylord Container	15	15⅜
Same Preferred	*91–100	*90–100
International Paper	46	44⅛
Same Preferred	105	102
Kimberly-Clark	22½	24¼
McAndrews & Forbes	*35½–37	34
Mead Corp.	21	21
Same Preferred	103	106
Same 2d Pref.	47¾	46½
Masonite	50½	51
National Container	28½	29⅜
Paraffine Cos.	*64½–66	60
Same Preferred	*107–110	107
Rayonier, Inc.	17⅞	18¼
Same Preferred	34⅛	35½
Scott Paper	47	46
Same Preferred	102	102
Sutherland Paper	*42½–43½	42⅜
U. S. Gypsum	110	107
Same Preferred	*187–194½	197
United Wall Paper	7½	7½
Same Preferred	*41½–45	*44–45
West Virginia P&P	34½	39¾
Same Preferred	*110–114	*114–116

New York Stock Exchange—Bonds

Abitibi 5%	...	...
Celotex 3½%	101⅝	103¾
Certain-teed Prod. 5½%	...	...
Champion P&F Co 3%	103⅛	103
Int. Paper 5%	...	...

New York Curb Exchange—Stocks

Am. Writing	8	7¾
Great Northern	40¼	40¼
Hummel Ross	18⅝	15½
St. Regis	9⅛	9⅝
Taggart	6⅜	7½

*Closing Bid and Asked Prices.

The 210" Bagley and Sewall Fourdrinier Machine at the New Deferiet Mill

Accomplishment HAS ITS REWARDS!

• The remarkable growth of the St. Regis Paper Company is indeed a success story. Congratulations are in order.

From a modest beginning, it has become one of the largest manufacturers of paper in this country.

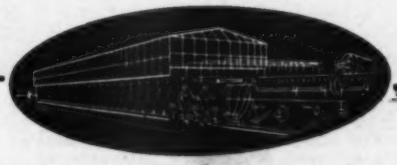
The policies of the Company, the diversification and quality of their products and consumer demand brought about the problem of additional manufacturing facilities.

The opening of the new mill at Deferiet, New York, equipped with a 210" Bagley and Sewall Fourdrinier machine, will assist the St. Regis Paper Company to meet these demands.

The Bagley and Sewall Company is proud to be among those who have helped.

BAGLEY & SEWALL

WATERTOWN, NEW YORK



NEKOOSA-EDWARDS HOLDS ANNUAL SALES CONFERENCE

For the fourteenth consecutive year sales representatives of the Nekoosa-Edwards Paper Company gathered at the company's home office, Port Edwards, Wisconsin, to attend the annual sales conference held November 19, 20 and 21. Representatives were in attendance from New York, Chicago, Los Angeles, Atlanta, and Erie.

The conference this year was called the "Birthday Conference" due to the celebration of the tenth anniversary of the introduction of the watermarked Nekoosa line of business papers. First day of the conference was devoted to a consideration of manufacturing improvements and expansion of production facilities. The second day was set aside for discussions pertaining directly to merchandising, and the final day of the conference was turned over to the sales representatives for round-table discussions of situations occurring in their respective territories.

Charles H. Reese, manager of manufacturing for the company, took charge of the discussions of manufacturing considerations for the first day of the conference. The sales representatives were escorted through the company mills and properties and given an opportunity to view at first hand the improved and expanded production facilities of the company. Mr. Reese then answered questions for the salesmen, most of which pertained to the installation of new equipment in the mills.

Drs. R. C. Crain and H. W. Rowe, of the company's technical department, delivered papers at the afternoon meetings Tuesday pertaining to technical advancements of the company during the past year.

Adam C. Remley, general sales manager, presided over the merchandising meetings held on the second day of the conference. Mr. Remley traced the growth of the company's line of mill brand special papers and watermarked business papers over the past several years and pointed out the means by which the company intends to foster the continuation of this growth.

The allotment and budget picture for 1947 was discussed by Carl A. Schiebler for fine papers and R. A. Love for wrapping and special papers. Mr. Schiebler is assistant general sales manager for the company, and Mr. Love is order department manager.

Costs, prices, and profits were taken up in papers by N. E. Nash, assistant to the president; C. A. Polansky, and Mr. Schiebler. The advertising program for 1947 was explained by T. R. Meyer, advertising manager, who pointed out that direct mail and media advertising for the coming year would continue to stress a tie-in between consumer paper buying and printer planning.

The Thursday meetings were devoted to round-table discussions among the salesmen with Mr. Remley presiding. The meetings were brought to a close with remarks by John E. Alexander, company president and general manager, and a finale by Mr. Remley.

On Monday evening, the sales representatives honored their chief, Adam C. Remley, with a surprise testimonial dinner; a testimonial scroll was presented to Mr. Remley by the salesmen in recognition of his outstanding leadership, trust and guidance during the several years he has directed their efforts. He was also awarded an elaborate dual fountain pen desk set with a gold plaque bearing an engraving of his name and a fac-simile of the Nekoosa Bond watermark.

The annual sales conference bowling tournament was held at the company Paper Inn alleys the evening of November 19. Prior to the bowling tournament, a banquet was held at the Paper Inn restaurant with members of the sales staff and company officials in attendance.

◆

POWELL RIVER HYDRAULIC BARKER BEGINS OPERATION

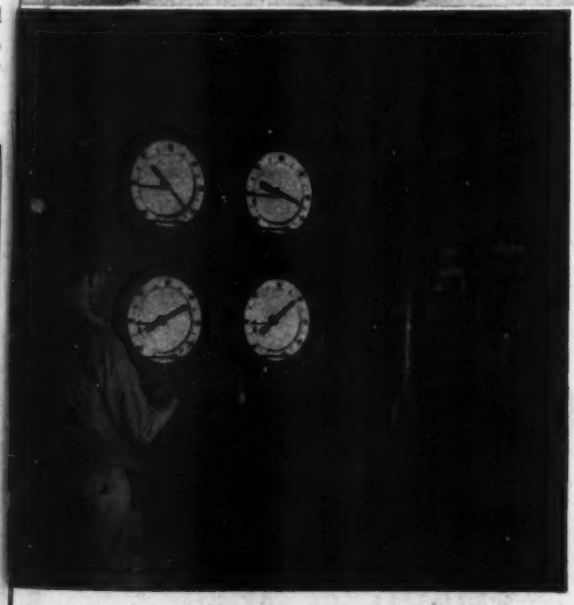
Climaxing a year of construction (Cf. P.I. & P.W., September, 1945) the Powell River Company, Limited, Powell River, British Columbia, has begun partial operation of its hydraulic barker. Use of the new machine is expected to save approximately ten per cent wood consumption per ton of products manufactured, at the same time it will provide adequate means of handling all of the company's wood for pulping.

Powell River's postwar expansion program has progressed further with the letting of a contract to the Dominion Engineering Company, Limited, Montreal, to manufacture a new highspeed newsprint machine which will accomplish a moderate increase in the output of this much needed paper when installed.

Plans are being formulated to eliminate the less efficient equipment when the new machine begins operation. It has also been disclosed that a contract for a paper mill drive has been awarded to Bepco Canada, Limited, Montreal, which will add to Powell River's operating capacity.

LEFT—Sales representatives with company officials at Nepco annual sales conference. Seated in the center, holding a photographic reproduction of the Nekoosa Bond watermark are John E. Alexander (left), president and general manager, and Adam C. Remley, general sales manager. RIGHT—Members of Nepco sales organization at banquet in honor of Adam C. Remley, general sales manager. Mr. Remley (left, rear) is congratulated by John E. Alexander, president and general manager

DIAMOND AUTOM[illegible]OCESS CONTROL KEEPS PRODUCTION [illegible]THE BEAM"



Ideal of instruments used in Diamond Automatic Process Control is this continuous analyzer in the Chlorine Plant.

Sentinels that never sleep watch every step of Diamond Alkali's manufacturing processes, protecting the uniformity and quality of Diamond products.

Many processes are conducted in tanks, towers or kilns where there is little opportunity for periodic sampling or visual inspection. But the probing, sensitive "fingers" of indicating or recording instruments reveal important facts as to conditions within.

With this data Diamond operators carefully watch and control the development of each process, thus insuring the high quality of the finished product.

ALKALI

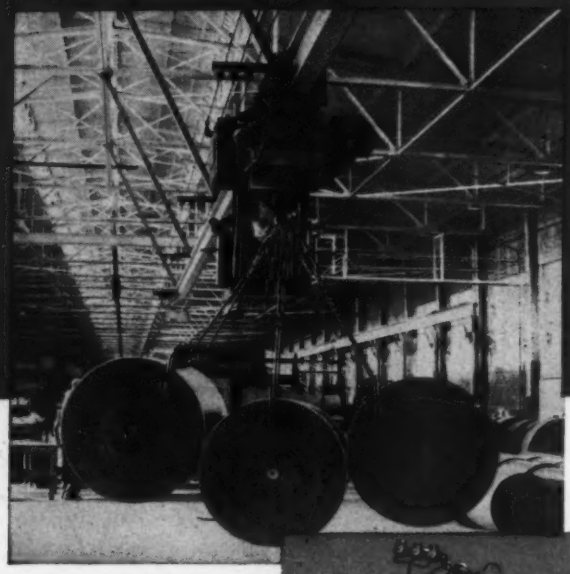
DIAMOND ALKALI COMPANY

Pittsburgh 22, Pa. and Everywhere

LIFTING HEIGHT *Increased* 2 FEET

WITH THIS

NORTHERN HI-LIFT ELECTRIC HOIST



This Northern Hi-Lift Electric Hoist provides two feet more lift for handling paper in a large southern mill.

Northern Hi-Lift Hoists provide 12″ to 36″ extra lift, according to the capacity hoist—providing that much extra height in your present buildings—or saving that much in new buildings.

Northern Hi-Lift Hoists are number one favorites in hundreds of mills due to their dependability and exceptionally heavy construction.

SEE THIS POWERFUL MECHANICAL LOAD BRAKE

The powerful automatic disc and helix type mechanical load brake in the Northern Hi-Lift Hoist controls the lowering load, and can stop it independently of the electric brake. All wearing parts accessible—particularly brake surface.

ROLLER BEARINGS—HARDENED STEEL GEARS

Machine cut hardened steel gears, ample size roller bearings, turned and ground shafts, press fits—one piece welded frame.

Gears operate in oil bath, and distribute lubricant to bearings.

TYPES OF NORTHERN HI-LIFT HOISTS AVAILABLE

Floor controlled hoists • Motor traveled hoists
Cab controlled hoists • Base mounted hoists

See our catalogs in Sweet's Files of Process, Mechanical and Engineering Industries.

New information on electric hoists, dimensions, engineering data, etc., is ready in this complete bulletin. Write today for Bulletin H-110.

NORTHERN ENGINEERING WORKS
[illegible] ATWATER ST.
DETROIT 7, MICH.

TWO EMPLOYEES REWARDED BY THE ROBT. GAIR CO. FOR DESIGNING A NEW MACHINE

Largest single awards made this year to employees of the Robert Gair Company, Gair Cartons Division, for suggestions or outstanding accomplishment, have been made to Heinz Ahlmeyer of Tappan, New York, and Whitney Sherman of Nyack, New York.

These men have received checks for $1,000 each in recognition of their designing and completing a new machine for automatic folding, punching, and gluing of the Gair Quick-Pac carry-home carton for soft drinks. Mr. Ahlmeyer and Mr. Sherman spent eighteen months in the development of their machine in addition to their duties with the company as supervisor of the box maintenance department and press machinist respectively.

The Gair Company has encouraged its employees to submit ideas through suggestion boxes. The system has proved successful, and it is being carried on in many Gair divisions.

◆

TENNESSEE IS 15TH STATE TO JOIN TREE FARM PROGRAM

Tennessee became the fifteenth state to join the nationwide Tree Farm program when approximately 100,000 acres of privately owned forest lands were certified in a dedication ceremony held at Waynesboro, November 20. Tennessee's Governor, Jim McCord, presented the Tree Farm certificates, and a varied program explaining and emphasizing the importance of tree cultivation as a means of insuring the future of the nation's forest resources was presented.

Charles A. Gillett, forester of the American Forest Products Industries, Incorporated (national co-ordinators of the Tree Farm program) reported on the nationwide scope of the tree farming movement. Mr. Gillett traced the development of tree farming from its inception in the state of Washington in 1941, to the adoption of the forest project in Tennessee. He pointed out that states in every important tree growing area have inaugurated Tree Farm programs or are planning to adopt the program as a major force in conservation and reforestation efforts.

◆

EMPLOYEE INSURANCE BENEFITS ARE INCREASED UNDER MANDO PLAN

A substantial increase in employee insurance benefits has been effected by the Minnesota and Ontario Paper Company. The additional health and accident and hospitalization features provide an increase to a maximum of $20.00 per week for illness or accident, and a raise to $4.50 a day hospitalization in addition to a hospital fees raise to $40.00 for X-rays, medicine, etc.

The increased allowances apply to employees' claims but do not increase dependency benefits.

Provision for the larger insurance schedule has been made available to MANDO employees without additional cost to them, and the plan is designed to give comprehensive coverage with the over-all low cost of group insurance purchasing.

PULPWOOD GRAPPLE PERMITS THE USE OF SMALL WOOD

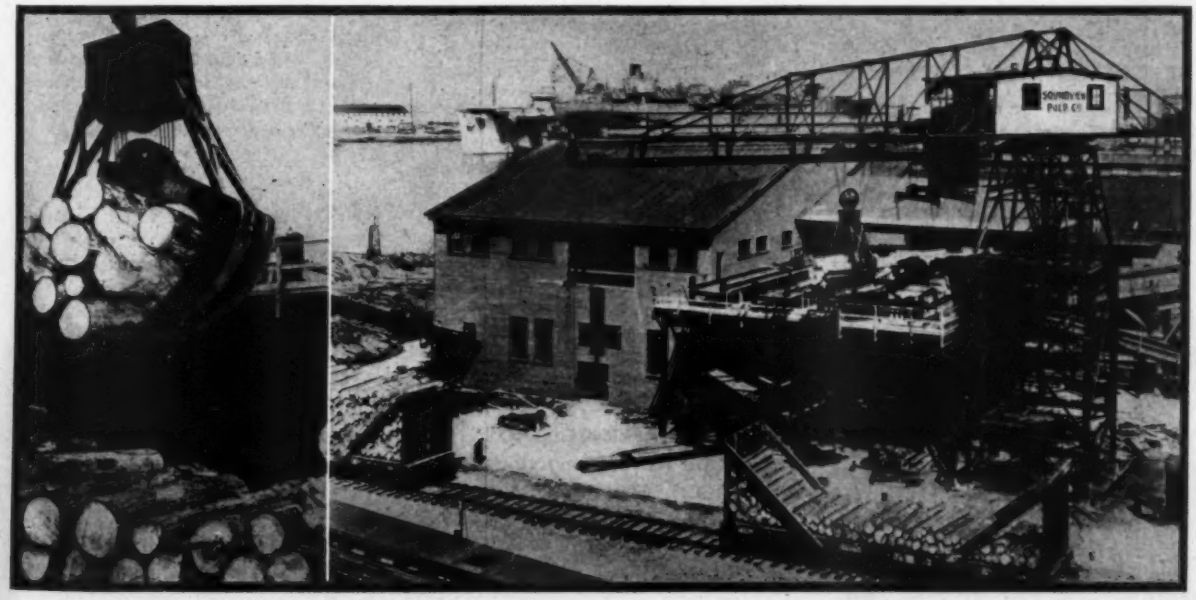
Shown in the accompanying illustration is a step in a new effort to increase the supply of pulpwood for paper production. A pulpwood grapple transfers small wood directly from delivery cars to the working floor of the new small-wood hydraulic barking plant of the Soundview Pulp Company, Everett, Washington.

The economical recovery of this small timber from the logged-off lands of the far west is a new development that permits increasing the production of pulp, while conserving timber.

Until recent years this phase of the movement for conservation lagged due to the difficulties of recovering and handling short timber. Large, mechanical grapples are among the tools which have made clean logging a practical measure. Through their use in the woods and at loading points, through the use of portable sawing mills, combined rail and motor vehicle transport, and newly developed small-wood hydraulic barkers, it is now possible to salvage timber formerly wasted.

In the case of this producer, one of the world's largest in the sulphite pulp field, the new techniques are calculated to save 20 per cent in wood usage. This will amount to about 40 million feet annually—a small forest saved for future use. Clean logging also contributes to ease of reforestation.

This particular unit is Blaw-Knox Company's size number 16 that was converted to a four-rope type for fleet-through operation from a hammerhead crane.



Grapple in use at Soundview Pulp Company—closeup shows grapple with a load of 8-ft. logs

QUEBEC GOVERNMENT BANS CONSTRUCTION OF NEW PULP AND PAPER MILLS

Addressing a gathering at Gatineau, Canada, recently, Premier Duplessis is reported to have made the statement that construction of new newsprint and pulp mills would be disallowed. Exceptions to the blanket policy of no new mills were the Quebec Pulp and Paper Mill at Chicoutime, and the St. Maurice Paper Mill at Cap de la Madeleine which government sources said would not be prevented from reopening.

Observers accredit the government's policy to three main considerations: First, the limited number of timber units now available. Second, a determination to keep the publishing companies from gaining control of the Quebec paper industry. Third, exercising a control over the paper manufacturing industry will in effect act as a means of controlling paper markets; thus, papermaking becomes a bargaining factor in the negotiation of trade agreements. Government sources indicate that construction limitation is not directed toward the expansion of existing paper companies.

Prior to his Gatineau address, Premier Duplessis, speaking before the Quebec Forestry Engineers' Association, is reported to have told the meeting that the province did not favor granting timber limits to newspaper owners and publishers. He stated that newspapers in the pulp and paper business would not aid in protecting free speech, and that entry by the newspapers and publishers into the paper manufacturing business might be a means of controlling the paper industry and the newsprint market.

◆

DR. SHIRLEY ADVOCATES MORE ASSISTANCE FOR SMALL WOODLAND OWNERS

Immediate and vigorous action is needed to put American forests on an uphill grade, according to an editorial by Dr. Hardy L. Shirley which appeared in the *Journal of Forestry* for December. The Journal is the official publication of the Society of American Foresters, and Dr. Shirley is editor of the publication, as well as assistant dean of The New York State College of Forestry at Syracuse University.

The editorial points out that the undertaking launched in New York through a new law providing free state assistance may prove valuable in solving the problem of small woodland production. More forest land is in small holdings than any other ownership, hence it is these producers who need more guidance and assistance in the management of their forests.

Dr. Shirley makes the point that should information already at hand covering sound forestry management be combined with the further information obtained in the application of state legislation such as the New York law, the national effort to encourage sound forestry practice will be successful.

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CLASS AT POLYTECHNIC INSTITUTE HEARS TALK BY VANCE P. EDWARDES

Sulphite pulping was the subject of a lecture delivered by Vance P. Edwardes, superintendent of the International Paper Company, at the October meeting of the Polytechnic Institute of Brooklyn's class in Pulp and Paper Technology.

Lectures scheduled for the month of November included H. H. Brown, consulting engineer, who discussed the use of bagasse and other non-woody material for pulping; and Rex Vincent, of the Bulkley, Dunton Pulp Company, who spoke on the types and combinations of pulp available to the paper maker.

The Pulp and Paper Technology course meets on Thursday nights and is open to qualified men in the industry.

◆

CROWN ZELLERBACH TAKES THE AIR IN REFORESTATION

Announcement made at Astoria, Oregon, by the Crown Zellerbach Corporation late in November indicated a new phase in experimental work in reseeding logged-over forest land was being contemplated. The reseeding experiment will be conducted using a helicopter.

C. W. Richen, chief forester for the company's Columbia River Division, stated that a newly developed tree seed pellet coated with fertilizer, root hormone, and a substance toxic to rodents will be used in the experiment. This seed pellet makes tree seeding by aircraft possible for the first time.

Six hundred acres in Clatsop County will be seeded from the air with Port Oxford cedar, nobel fir, white fir, and hemlock. Another two hundred acres will be seeded in the traditional way with baby fir trees.

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CENTRAL PAPER CONTROL LAB. ALMOST FINISHED— TECH. STAFF REORGANIZED

With the work on its new research laboratory nearly completed, Central Paper Company, Inc., Muskegon, Michigan, has announced plans for reorganization of its technical staff.

In line with company policy for complete control of process from wood to the finished product, Robert L. Knickerbocker, chemist with the company for a number of years, has been appointed director of control laboratory. Mr. Knickerbocker is well fitted for this position because of his previous experience with the company. He will be in complete charge of the technical control of the company's processes and products. This step along with the separation of the control laboratory from other research work performed by the previous staff will add to the efficiency of control and quality of the products manufactured by the company.

C. W. Smith, president of the company, states that appointments of the research staff will be announced later.

▶▶▶ CONSTRUCTION HAS begun on a $100,000 addition to the Cascade Mill of the West Tacoma Newsprint Company, West Tacoma, Washington. The Cascade Mill has been idle for nine years, but with CPA approval building is under way which will allow a grinder building (54 x 95 ft.), a 100 x 200 ft. wood preparation building, a reinforced concrete flume, and a 350-foot railway spur. Operation of the plant will be resumed when construction is completed.

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▶▶▶ ELEVEN EMPLOYEES were given awards by Crane & Company, Dalton, Massachusetts, for suggestions received during September and October. Cash awards totaled $68.45; individual prizes ranged from $5.00 to $18.45.

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▶▶▶ APPROVAL HAS BEEN granted by the CPA which will permit the Crown Zellerbach Corporation to undertake the construction of a paper products plant at Seattle, Washington. It is estimated that the project will cost $350,000.

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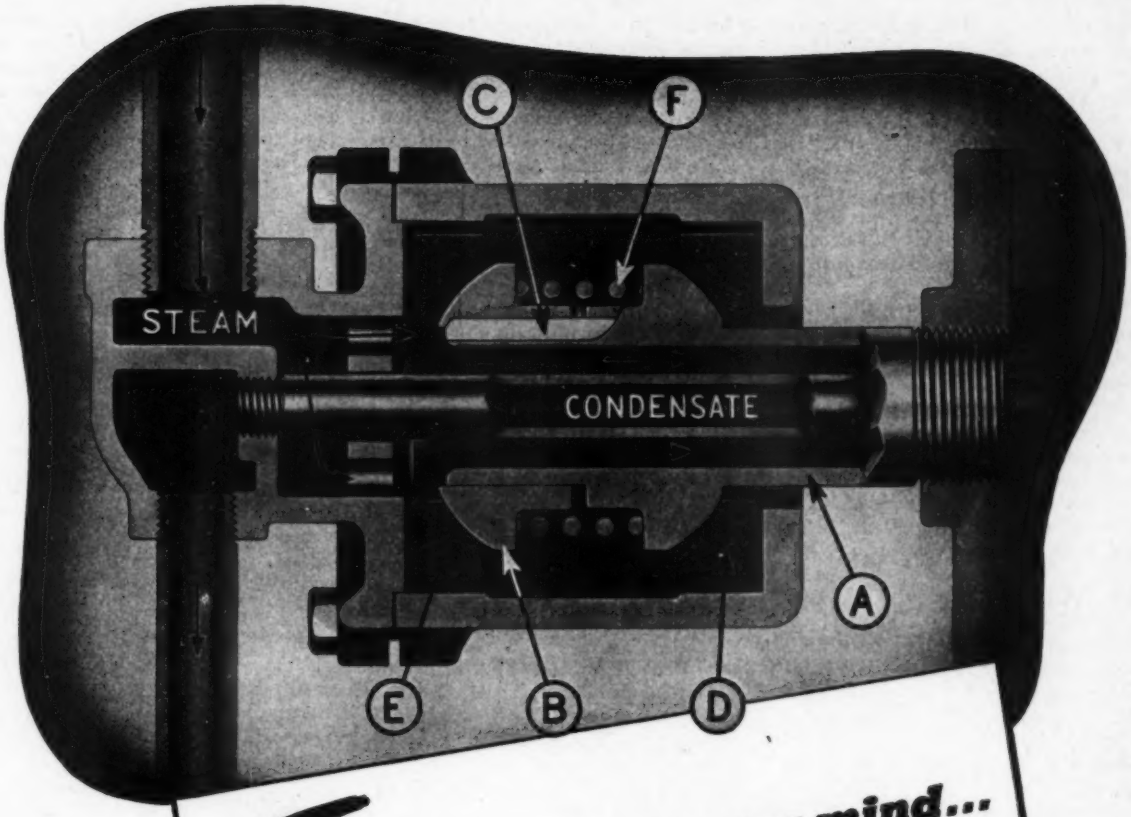
▶▶▶ A NEW BOX PLANT went into operation early in November at Portland, Oregon. The owners are J. B. Conklin and Mrs. E. Milbrandt, who was formerly co-owner with her late husband of the Pacific Paper Box Company. The organization is known as Paramount Paper Box Company and the new plant is equipped with the



Turn this over in your mind...

Get a clear picture of *how* the Johnson Joint works, see *what* it accomplishes, and you will understand why it has so completely outmoded all the old stuffing boxes and steam fits.

In actual operation you would see the parts marked (A) and (B) rotating with the roll or drum. These are the nipple and sliding collar, keyed to rotate together (C), but fitted together only loosely so pressure can fill the entire housing. You might see too the action of this pressure in forcing the carbon-graphite seal ring (D) tightly against the nipple to effect the seal.

Follow that much of the operation and you have basically the whole picture. The second carbon-graphite ring (E) serves as a bearing; the spring (F) is for initial seating only.

Now see how this simple design ends all the tinkering and servicing demanded by stuffing boxes. It has no packing whatsoever. It needs no oiling — the carbon-graphite rings are self-lubricating. It adjusts itself automatically for varying pressures. It minimizes danger of damage from misalignment, both angular and lateral. Note besides how neatly it provides for more efficient syphon drainage of rolls.

In immediate returns, the Johnson Joint brings savings in maintenance which alone will pay its cost in a short while. In the larger, more important, sense it reduces machinery shutdown and promotes overall plant efficiency out of all proportion to its size and cost. No wonder so many machinery manufacturers furnish Johnson Joints as standard equipment. No wonder industry has already purchased more than 100,000 Johnson Rotary Pressure Joints, in barely ten years.

Type B Joint illustrated above. Other types, sizes for all needs. Write for literature.

THE JOHNSON CORPORATION
845 WOOD STREET, THREE RIVERS, MICHIGAN

JOHNSON
Rotary Pressure
JOINTS

latest type of machinery for making paper boxes; one feature being a high speed wrapping machine for putting fancy papers on gift boxes.

◆

▶▶▶ PERMISSION HAS BEEN granted the Champion-International Company, Lawrence, Massachusetts, to erect a two-story, masonry, manufacturing building in that city. The new structure will cost approximately $50,000.

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▶▶▶ CONSTRUCTION OF a $450,000 addition to the Gulf States Paper Corporation plant at Tuscaloosa, Alabama, was approved by the CPA on November 8. Officials of the Gulf States organization reported that the plant capacity would be increased from 200 tons to 300 tons a day. The proposed construction will begin as soon as materials are available.

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▶▶▶ PULPWOOD HARVESTED from the Green-Sullivan State Forest of Indiana has been shipped to Chillicothe, Ohio, to be used in the manufacture of paper for use in the slick paper magazines. The carload sale of pulpwood, first ever harvested in Indiana, will show a definite profit for the state.

▶▶▶ RESIDENTS OF the paper mill district south of Stevens Point, Wiscosin, have begun proceedings to incorporate a new village. The Whiting-Plover Paper Company is among the mills operating in the area, and the people have voted to name the village Whiting.

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▶▶▶ CONTRACT FOR a new mill building, which, with machinery will cost approximately $1,250,000, has been placed by Fernstrom Paper Mills, Inc., Pomona, California.

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▶▶▶ TWELVE NEW INITIATES to the Quarter Century Club of the Hummel & Downing Company, Milwaukee, Wisconsin, now brings the total membership to seventy. In an election of officers to serve for the coming year's club activities, Frank A. Kleiler was made president, O. M. Bonesho, vice president, and Elsie G. MacArthur, secretary-treasurer.

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▶▶▶ PURCHASE OF THE Flambeau Paper Company, Park Falls, Wisconsin, by the *Kansas City Star* has been announced. The Kansas City newspaper bought the mill for $3,000,000 and will use it in the manufacture of newsprint for its own consumption. The Flambeau mill was formerly engaged in the manufacture of groundwood and specialty papers. Ownership of the mill was taken over by "The Star" on November 15.

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▶▶▶ LAND AND BUILDINGS owned by the Sandusky Foundry & Machine Company (Sandusky, Ohio) and occupied by the Scott Paper Company have been purchased by the latter company. The Scott plant is located on the Ohio River waterfront and is used in the manufacture of wax, cutlery, and box papers.

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▶▶▶ CELEBRATING THE Fifteenth Anniversary of the operation of the Weyerhaeuser pulp division at Longview, Washington, a banquet was given at which forty-seven of the original employees were present.

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▶▶▶ PUBLICATION OF a monthly plant newspaper has been undertaken at the Brightwater Paper Company's, Adams, Massachusetts, mill. The paper is to be edited and managed by the employees, and while it is to be a joint medium of the employees and management, it will not be under strict company control. The paper will print news items of local and national and international importance, as well as reporting on the social and sporting life of the Brightwater employees. A contest is being held to find a name for the paper.

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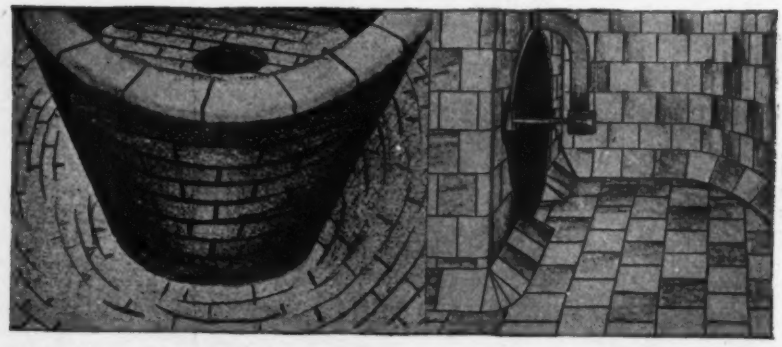
▶▶▶ PROPERTY OWNED by the Simon Oil Company in North Tonawanda, New York, has been purchased by the Electric City Paper Mills, Incorporated, Niagara Falls, New York. The purchase is part of an expansion move by the Electric City company which is limited by the lack of available space in Niagara Falls.

◆

▶▶▶ EXHIBITS AT sixteen local fairs in three northern New England states during the past three months has served effectively in public relations for the Brown Company, Berlin, New Hampshire. It is estimated that approximately 60,000 people learned something about the company through pictures and posters which illustrated the vast operations of the woods department; there were also exhibits of manufactured products of the various mills. The exhibit was handled by Mark E. Hamlin, Burton Corkum, and Bernard Faunce, of the woods department, and J. Arthur Sullivan and Donald Tetley, of the company relations department.



Practically Complete Coverage

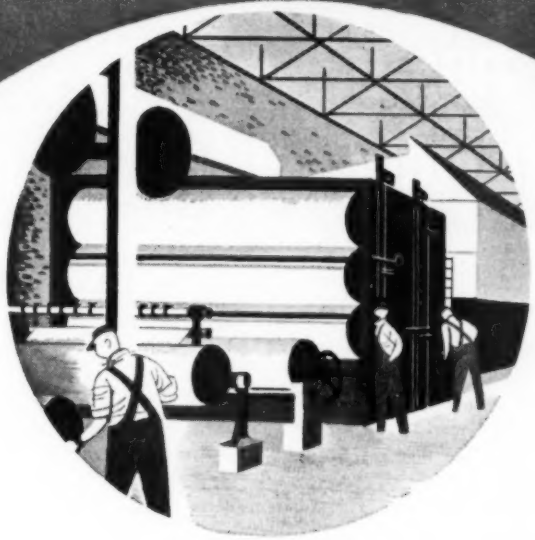
A check of the newer (post-war) bleach plants on the North American Continent shows that practically all of them contain Stebbins linings.

This coverage is the result of working for 62 years with pulp and paper men in designing, installing and servicing linings and tile tanks exclusively.

This service has saved pulp and paper manufacturers many thousands of dollars. Ask a Stebbins lining or tank specialist to work with you on your next lining or tile tank job.

Stebbins Engineering and Manufacturing Company

EASTERN BOULEVARD, WATERTOWN, NEW YORK



paper's stock answer to bacteria...

How Dowicides Prevent Damage and Losses

Every production field in which microbiological control is important can take a cue from the successful use of Dowicides in the paper industry, which must fight mold and bacteria in nearly every stage of manufacturing.

From logs to finished product, the moisture-laden processes of paper-making encourage the growth and destructive activity of microorganisms. Dowicides are effectively used to prevent sap stain and decay of pulp wood, to protect lap stock from fungi which cause discoloration and loss, to control slime in wet machine operations, to preserve coating and sizing materials and in other ways.

Dowicides in their many forms combine lasting effectiveness, ease of handling and low cost for many industries—paper, textiles, paint, leather, lumber, adhesives, petroleum. If mold, termites or bacteria are your problem, ask Dow how Dowicides can help you.

DOWICIDE

germicides and fungicides

control termites mold and bacteria

DOWICIDES IN THE PAPER INDUSTRY

In paper manufacturing, Dowicides have proved their wide usefulness in combatting destructive mold. Dowicides have been found to increase wet felt life as much as 60 per cent. They also aid in slime control, in preserving log and pulp stock, in making packaging papers mold-resistant and in reducing maintenance costs.

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Cleveland • Detroit • Chicago
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DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND AGRICULTURE

POWELL has the *right* Valves for *all* your Flow Control requirements!

125-pound Iron Body Bronze Mounted or All Iron O. S. & Y. Gate Valve.

200-pound Bronze Gate Valve with renewable disc.

This may sound like a broad statement—but we can back it up. Because, through 100 years of making valves—and valves only—Powell has always been ready with valves that are *right*—in both design and material—to meet *all* demands imposed by the amazing growth of American Industry.

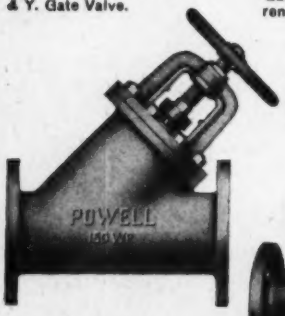
Today the Powell Line includes Bronze and Iron Valves of every necessary type, size, design and working pressure; Cast Steel Valves of every type in pressure classes from 150 to 2500 pounds; and a complete line of Corrosion-Resistant Valves, including many special designs and made in the widest range of pure metals and special alloys ever used in making valves.

200-pound Bronze Globe Valve. Regrindable, renewable semi-cone plug-type seat and disc.

The Wm. Powell Co., Cincinnati 22, Ohio

DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

Catalogs on request. Kindly state whether you are chiefly interested in Bronze, Iron, Cast, Steel or Corrosion-Resistant Valves.



150-pound Stainless Steel O. S. & Y. "Y" Valve.

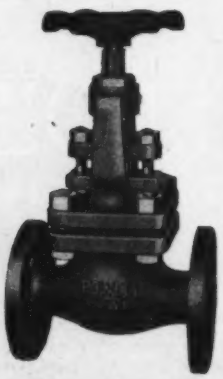
150-pound O. S. & Y. "Y" Valve with Powell Patented Seat Wiper.

Large 250-pound Iron Body Bronze Mounted Regrinding Horizontal Swing Check Valve.

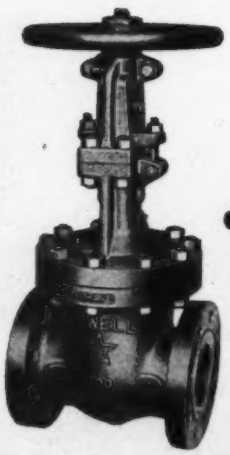
125-pound Iron Body Bronze Mounted "Master Pilot" Gate Valve.

New Standard 150-pound Stainless Steel O. S. & Y. Gate Valve.

125-pound Iron Body Bronze Mounted or All Iron O. S. & Y. Globe Valve.

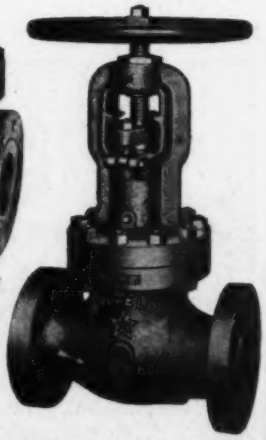


150-pound Stainless Steel O. S. & Y. Gate Valve.



Class 300-pound Cast Steel O. S. & Y. Gate Valve.

Class 600-pound Cast Steel Globe Valve.



POWELL VALVES

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46

For **RELIABILITY**

Ample clearances, high quality workmanship and proved features of design assure reliable operation over long periods of use.

ECONOMY

particularly where steam also is required for heating or process.

SPEED CONTROL

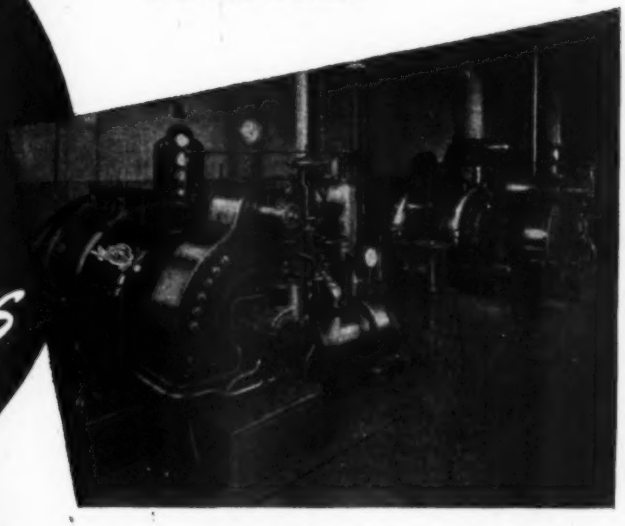
where close regulation and speed variation is desired

De Laval Class C Velocity Stage Turbine Driving De Laval Boiler Feed Pumps.

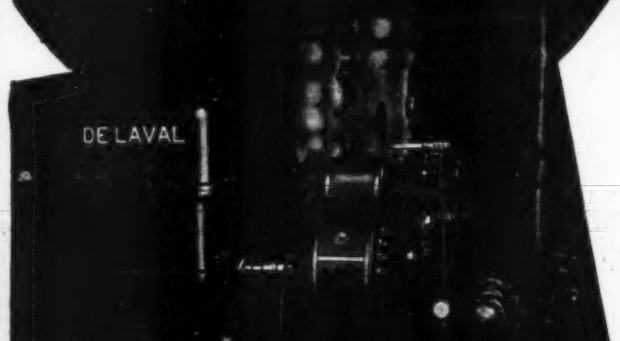
Install

DE LAVAL

SINGLE STAGE TURBINES



De Laval Centrifugal Compressor Driven by De Laval Velocity Stage Turbine. Exhaust Steam from the turbine is used in processes throughout the plant.



Paper Machine Driven by a 225 Horsepower De Laval Velocity Stage Turbine Through De Laval Worm Gear.

T-2

TURBINES • HELICAL GEARS • WORM GEAR SPEED REDUCERS • CENTRIFUGAL PUMPS • CENTRIFUGAL BLOWERS AND COMPRESSORS • IMO OIL PUMPS

DE LAVAL

STEAM TURBINE COMPANY
TRENTON 2, NEW JERSEY

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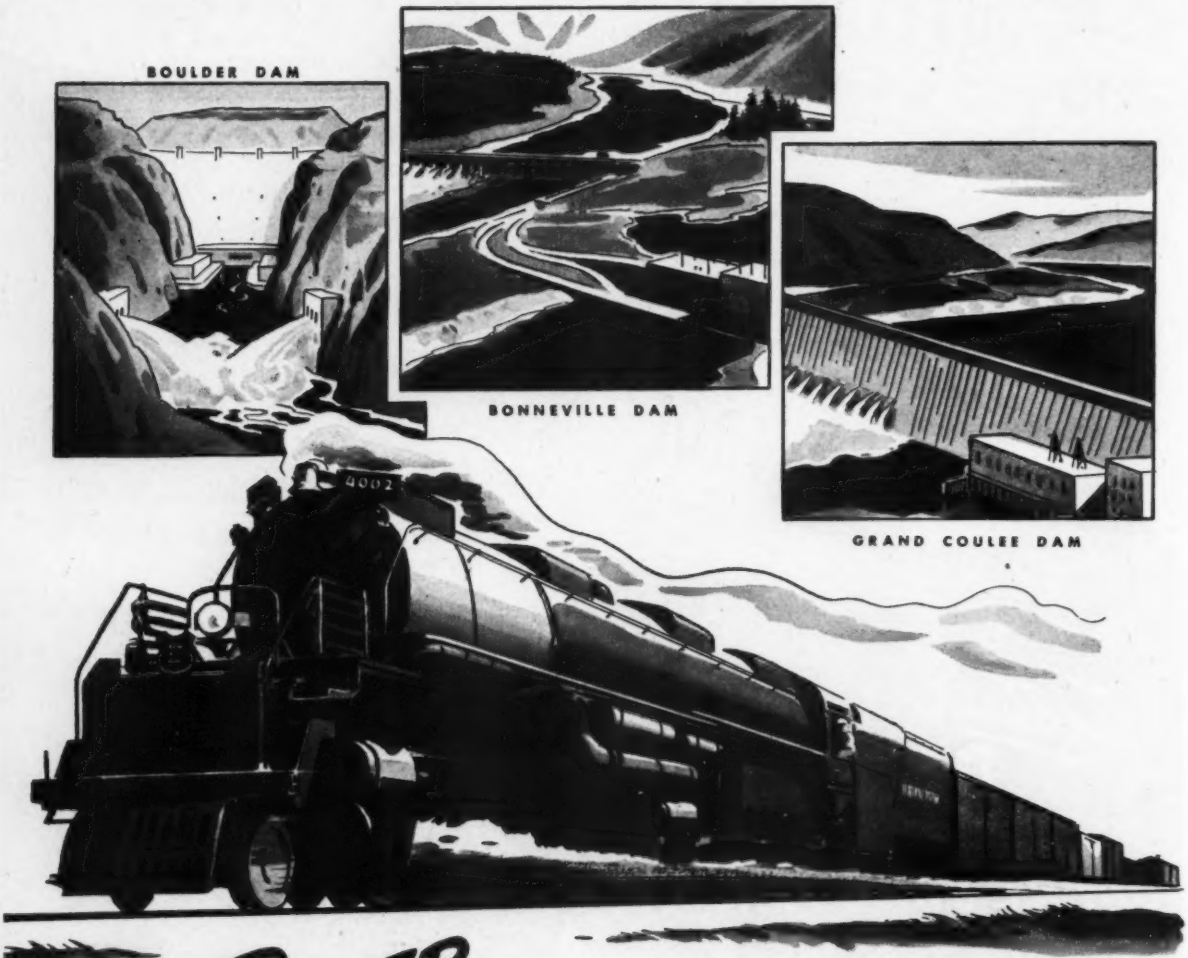
A MESSAGE TO THE PAPER INDUSTRY

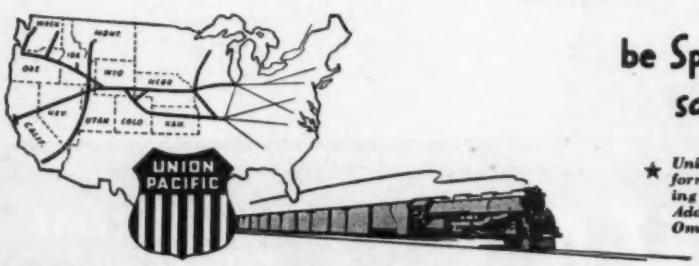


More POWER to You

Three great dams, harnessing the natural force of the Colorado and Columbia Rivers, provide tremendous industrial power.

Giants of the rails, the Union Pacific "Big Boy" locomotives provide freight transportation power over the Strategic Middle Route.

Power, light, and efficient transportation . . . combined with a wealth of raw materials and adequate "growing space" . . . offer unusual opportunities for industry in the Union Pacific West.



be Specific – say "Union Pacific"

★ *Union Pacific will gladly furnish confidential information regarding available industrial sites having trackage facilities in the territory it serves. Address Industrial Dept., Union Pacific Railroad, Omaha 2, Nebraska.*

UNION PACIFIC RAILROAD

The Strategic Middle Route

GIVING LOADS THE "BRUSH-OFF"

with a TOWMOTOR UNLOADER

Here's mechanical handling, from a fork lift truck, that completely eliminates manual unloading of stable loads. The Towmotor Unloader saves time and labor by unloading an entire load with a single, sweeping motion.

Newest of the Towmotor Accessory Group, the Unloader cuts carloading time 50%, permits placing of loads anywhere, with or without pallet. Does not interfere with normal lift truck operation. Screen height and length of unloading stroke furnished as required. Installed at the factory, the Unloader is available for use with most new Towmotor models.

Send for special bulletins describing the Towmotor . . .

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The COAT reflects taste...

. . . just as coated paper reflects the taste,
and the choice, of discriminating people.
And the production of high-grade coated paper—
at the speed required by modern conditions
—demands a Calcium Carbonate of high quality.

Wyandotte Precipitated Calcium Carbonate is
unsurpassed—in brightness . . . in freedom from
grit and abrasiveness . . . in hiding power
and ink absorption . . . in that uniformity
which is essential to machine coating.

This superiority of Wyandotte Precipitated
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how," built upon long experience in the field.
For years Wyandotte Chemicals Corporation has made a
business of producing a Precipitated Calcium
Carbonate to meet the highest standards.

That is why, today, the paper industry looks to Wyandotte
for the finest in Precipitated Calcium Carbonate.

Technical bulletins are available upon request.

Wyandotte
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Calcium Carbonate • Calcium Chloride • Hydrogen
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IMMEDIATE DELIVERY

STAINLESS STEEL

COOPER ALLOY

WELDING FITTINGS

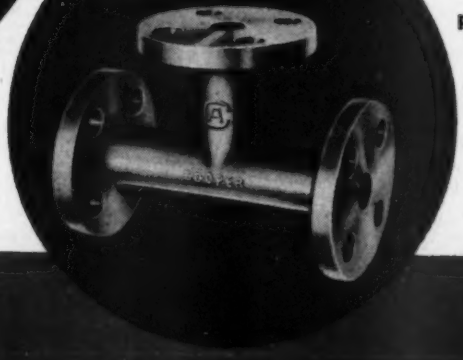
* SEAMLESS FORGED

* PRESSED and WELDED

STAINLESS STEEL SCREWED FITTINGS

Cooper offers a complete line of Stainless Steel Welding Fittings including 45°, 90° and 180° elbows, tees, caps, reducers and lap joint stub ends. Each are annealed, sandblasted and passivated for maximum corrosion, abrasion and heat resisting characteristics. The unusual performance of these fittings is the result of Cooper's 25 years of Stainless Steel "know-how."

STAINLESS STEEL FLANGED FITTINGS



THE COOPER ALLOY FOUNDRY CO.

HILLSIDE, NEW JERSEY

World's largest producer of Stainless Steel Screwed, Flanged and Welding Fittings

THE INSIDE STORY

IT PAYS TO KNOW *MORE* ABOUT

HERCULES

Y OF SIZE

Hercules can help keep products *inside* your containers with a complete line of wax rosin sizes and wax emulsions. Hercules Paracols* (wax emulsions) and plasticized dry rosin sizes form a group of sizing agents which impart the high degree of water resistance required in containers such as milk and ice cream cartons, paper cups, frozen food containers, coasters, butchers' papers, and wrappings for moisture-laden foods.

Paracols added at the beater, applied at the size press, or the calender stack, improve finish and reduce curl, as well as contribute to water resistance. Because of their wide range of properties, these Hercules products permit virtually tailor-made selection for almost any wax sizing need.

Write for details on these and other Hercules sizes and papermakers' chemical materials.

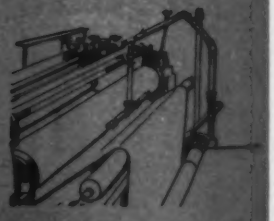
*Reg. U. S. Pat. Off. by Hercules Powder Company

Hercules chemical materials for the paper industry include:

Staybelite* Esters...
Wax additives for coating and laminating processes, modifiers for GRS and Neoprene latices for impregnating and laminating paper and board stocks.

Hercolyn*...
A liquid resin for transparentizing. Possessing excellent fiber-wetting properties, it is useful for the production of transparent and translucent papers.

Chemical Cotton...
Hercules chemical cotton is a pure cellulose, in loose or sheet form. Cleanliness and brightness are outstanding.



Casein...
Hercules casein is used as the binder in clay-coatings, and as an adhesive in laminants and paper converting.

Paracols*...
Water-dispersible wax emulsions used to increase finish, flexibility, printability, and waterproofing of paper.

Chemicals...
These include sulphonated oils, foam killers, sweeners, acids, alkalies, alum, and satin white.

FOR FURTHER DETAILS

Papermakers Chemical Department
HERCULES POWDER COMPANY
INCORPORATED
961 King Street, Wilmington 99, Delaware

Please send information on_____

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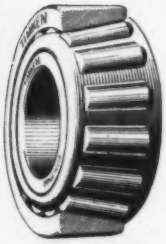
HEMICAL MATERIALS FOR HE PAPER INDUSTRY

WE MOUNT IT—
WE HOUSE IT—
WE SEAL IT—

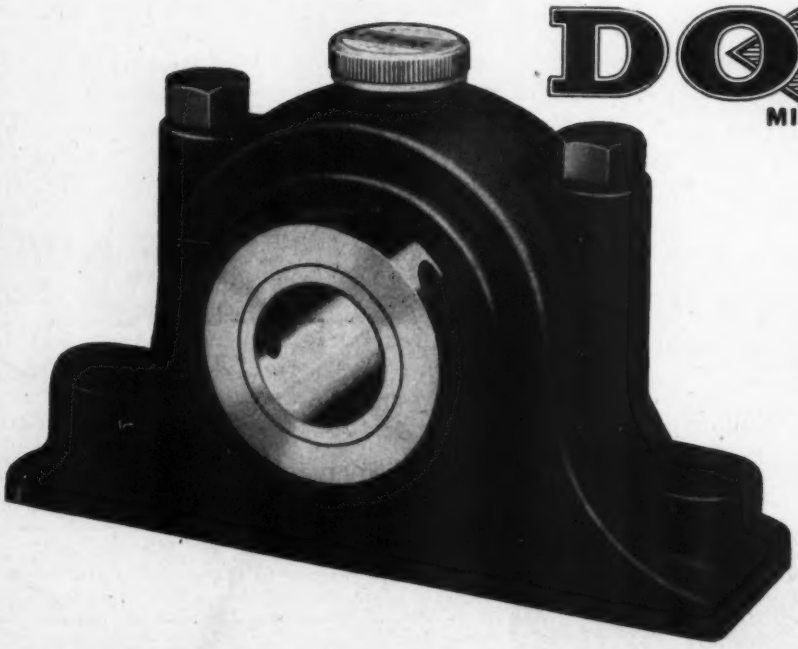


DODGE PUTS TIMKEN BEARING PRECISION INTO *WORKING CLOTHES*

THE DODGE-TIMKEN DOUBLE INTERLOCK PILLOW BLOCK provides a precision bearing assembly, *ready for immediate service.* You simply lock it on the shaft and run at full speed and full load. All the parts required for mounting this bearing are manufactured by Dodge — cast in our foundry and carried through many precision operations on the latest machine tool equipment. Dodge mounts, seals and houses the bearing assembly — with its double row of precision-finished rollers — and delivers it fully assembled, adjusted, lubricated — ready to go to work. The Dodge-Timken Double Interlock is one of the famous Dodge 30,000 hour line, covering a wide range of industrial bearing requirements, and ordinarily is available promptly from distributors' stocks. Look for the Dodge Distributor in your classified telephone directory under "Power Transmission Equipment."

DODGE MANUFACTURING CORPORATION • MISHAWAKA, INDIANA

DODGE
MISHAWAKA



THE SYMBOL THAT CAME TO LIFE

The man who wears this symbol gives you the correct answers to your problems in mechanical transmission of power. He is the Dodge Transmissioneer.

Transmissioneering Means Advanced Design in Power Drives

Copyright, 1946, Dodge Mfg. Corp.

NAME PLATES

FOR YOUR NAME PLATE REQUIREMENTS, WRITE OUR SUBSIDIARY, ETCHING COMPANY OF AMERICA, 1520 MONTANA STREET, CHICAGO 14, ILLINOIS

WHAT NEXT WILL BE MADE FROM PAPER? That same question was asked when the first paper napkin appeared. It was asked when paper draperies for our living rooms were produced; wall board for our building construction; moisture and heat resisting cartons and containers; gleaming table tops from plastics treated paper.

Just as the famous WALDRON Converting Machines made these and thousands of other products possible in the past they will continue to transform raw paper stock into newer and better products for the future. Long experience has equipped WALDRON designers and builders to know the trend, to plan the machines for the new processes and products now in the development stage. Witness the recently developed new methods for coating, laminating and impregnating — the direct result of newly designed WALDRON machines.

WHAT NEXT? Watch WALDRON —or better still consult us on your problems or plans.

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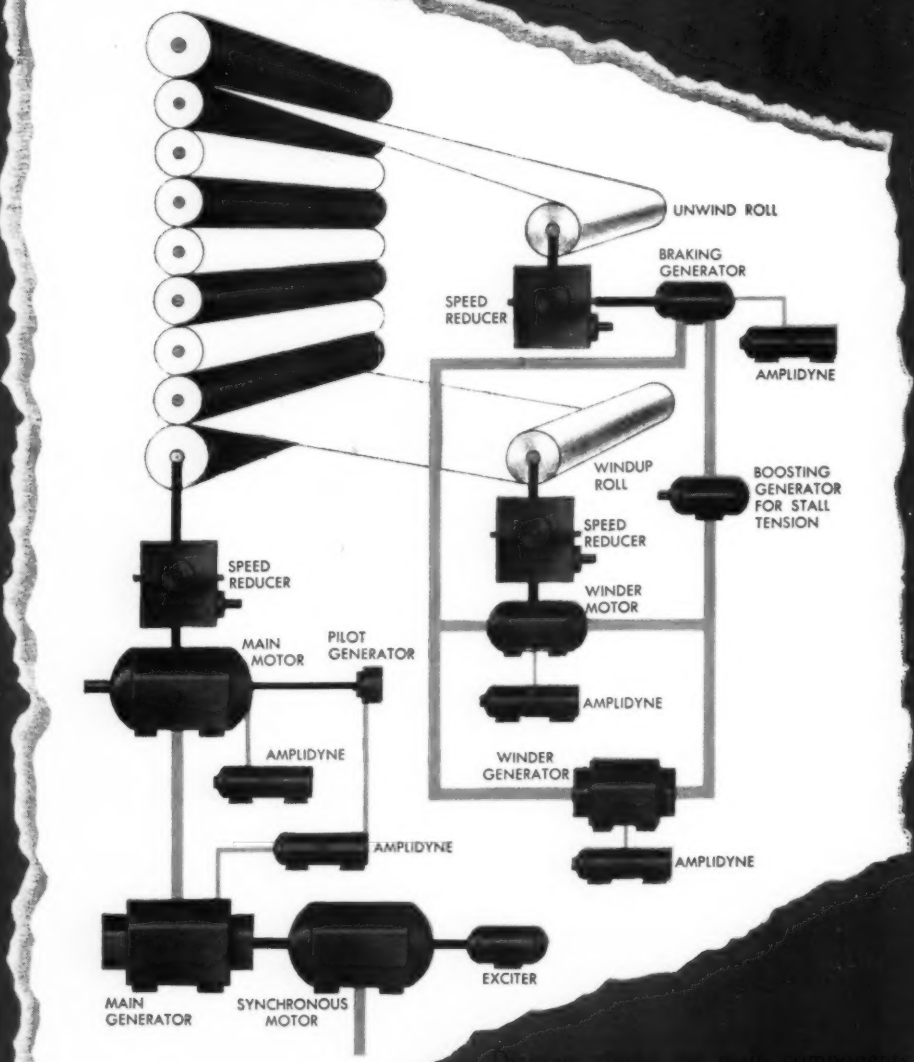
BUILDERS OF QUALITY MACHINES SINCE 1827

Faster


UNWIND ROLL
BRAKING GENERATOR
SPEED REDUCER
AMPLIDYNE
WINDUP ROLL
BOOSTING GENERATOR FOR STALL TENSION
SPEED REDUCER
SPEED REDUCER
WINDER MOTOR
MAIN MOTOR
PILOT GENERATOR
AMPLIDYNE
AMPLIDYNE
WINDER GENERATOR
AMPLIDYNE
AMPLIDYNE
EXCITER
MAIN GENERATOR
SYNCHRONOUS MOTOR

cceleration *fewer breaks*

NEW G-E AMPLIDYNE SUPERCALENDER DRIVE

permits higher operating speeds—more precise control—greater output!

(TOP) Supercalender equipped with a G-E adjustable-voltage, adjustable-speed drive. High-speed acceleration is obtained.

(BELOW) The new G-E drive employs an m-g set like that shown here. Three units are induction motor, d-c generator, and exciter.

Here is a new adjustable-voltage, adjustable-speed drive for *high-speed* supercalenders. Note those words, "*high speed*"! For the first time, you can equip your machines with a drive that accelerates at speeds only recently considered impracticable. Breakage is reduced to a minimum. Your supercalenders can keep in step with today's speeded-up mill operations.

Key to these higher operating speeds is the G-E amplidyne—the "amplifying generator with a brain." This new amplidyne control gives you—

—controlled rates of acceleration and deceleration that allow acceleration as fast as 50 fpm per second.

—provision for automatic inertia compensation during acceleration and deceleration.

—preset speed control which permits quick adjustment of supercalender speeds.

—stable calender "threading" speeds. Full provision for jog operation.

—easy fingertip adjustment of supercalender speed, unwind sheet tension, and windup sheet tension.

G-E experience in (1) combining electronic and amplidyne control and (2) broad-scale paper-mill electrification has produced many unique drives for grinders, chippers, stock-preparation machines, winders, paper machines, and—now—high-speed supercalenders. Why not discuss your drive problems with a G-E application engineer? Call or write your nearest G-E office. *Apparatus Dept., General Electric Co., Schenectady 5, N. Y.*

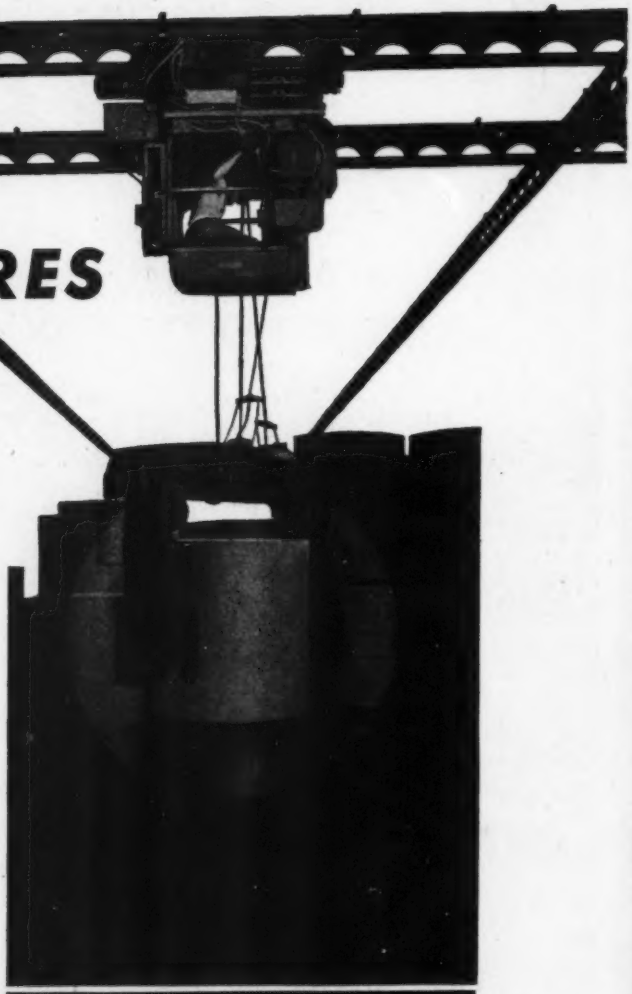
PAPER MILL *Drives*

GENERAL ELECTRIC

MOTORIZED ROLL GRAB

has

NOVEL FEATURES

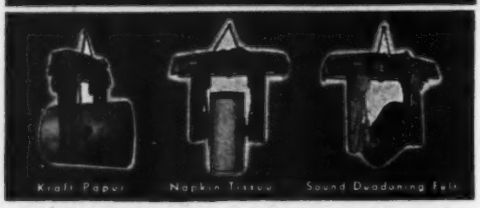


The new Cleveland Tramrail roll grab handles rolls from 16-inch minimum to 60-inch maximum diameter in lengths up to 72 inches and weighing up to 5,000 pounds.

All motions are motorized, and are controlled from the crane operator's cab. Three motors are provided. One motor spreads and retracts the grab arms. Another squeezes the roll grippers after they have been brought close to the roll, and thus securely locks the roll in position and prevents any possibility of slipping away and falling in transit. The third motor operates the turn-over mechanism which makes it possible to pick up a roll in any position and place it in any other position. Thus a roll piled vertically can be picked up and placed in a horizontal position.

When a roll in the vertical position is to be picked up and delivered in a horizontal position, or vice versa, the turn-over mechanism can be operated while the crane is in motion, thus saving time that ordinarily would be consumed for this operation.

The grab is suitable for the handling of all grades and thicknesses of paper, from light crepe and tissue paper, sound-deadening felt to kraft and hard box-board. It is sold for use on Cleveland Tramrail only.



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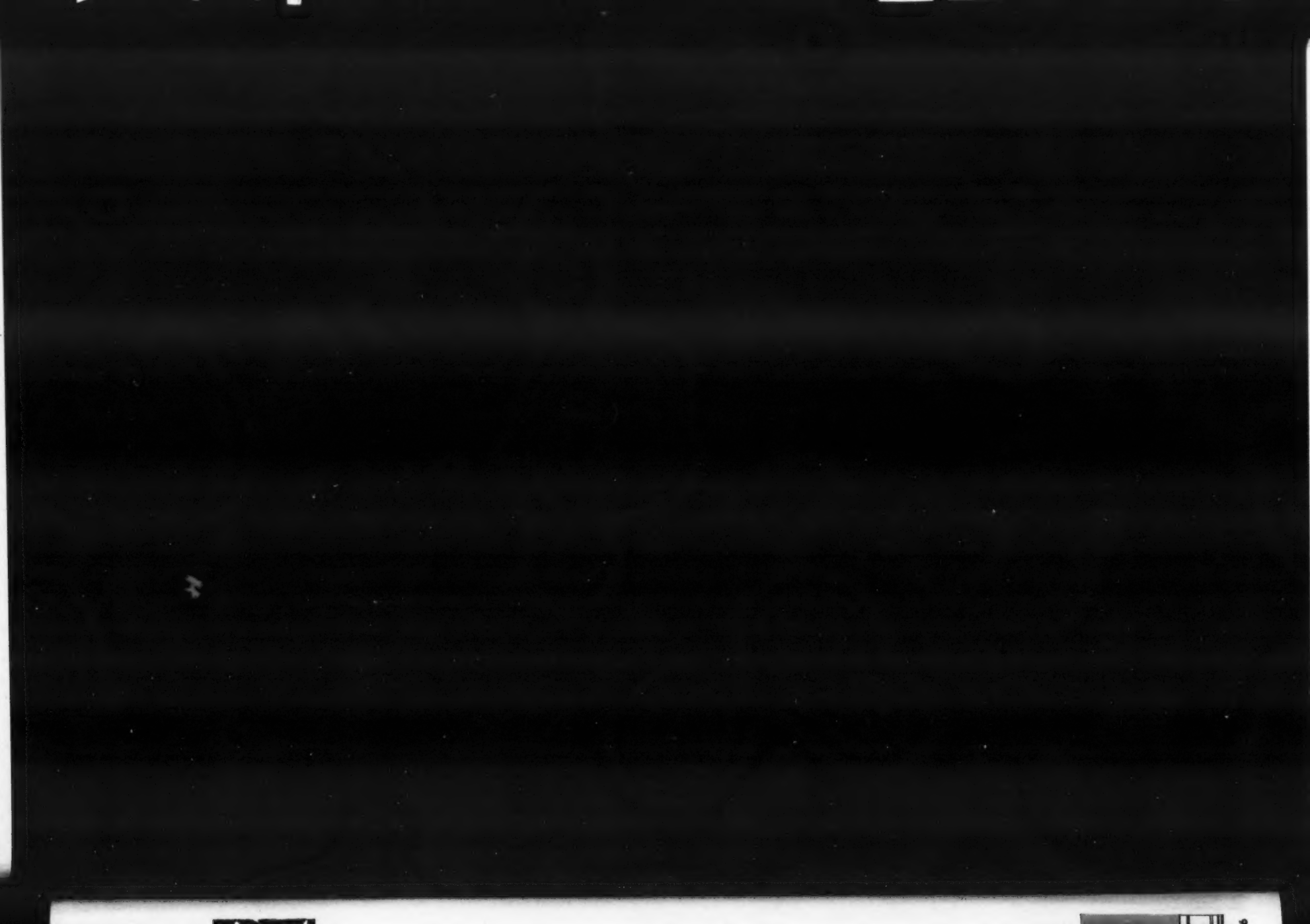
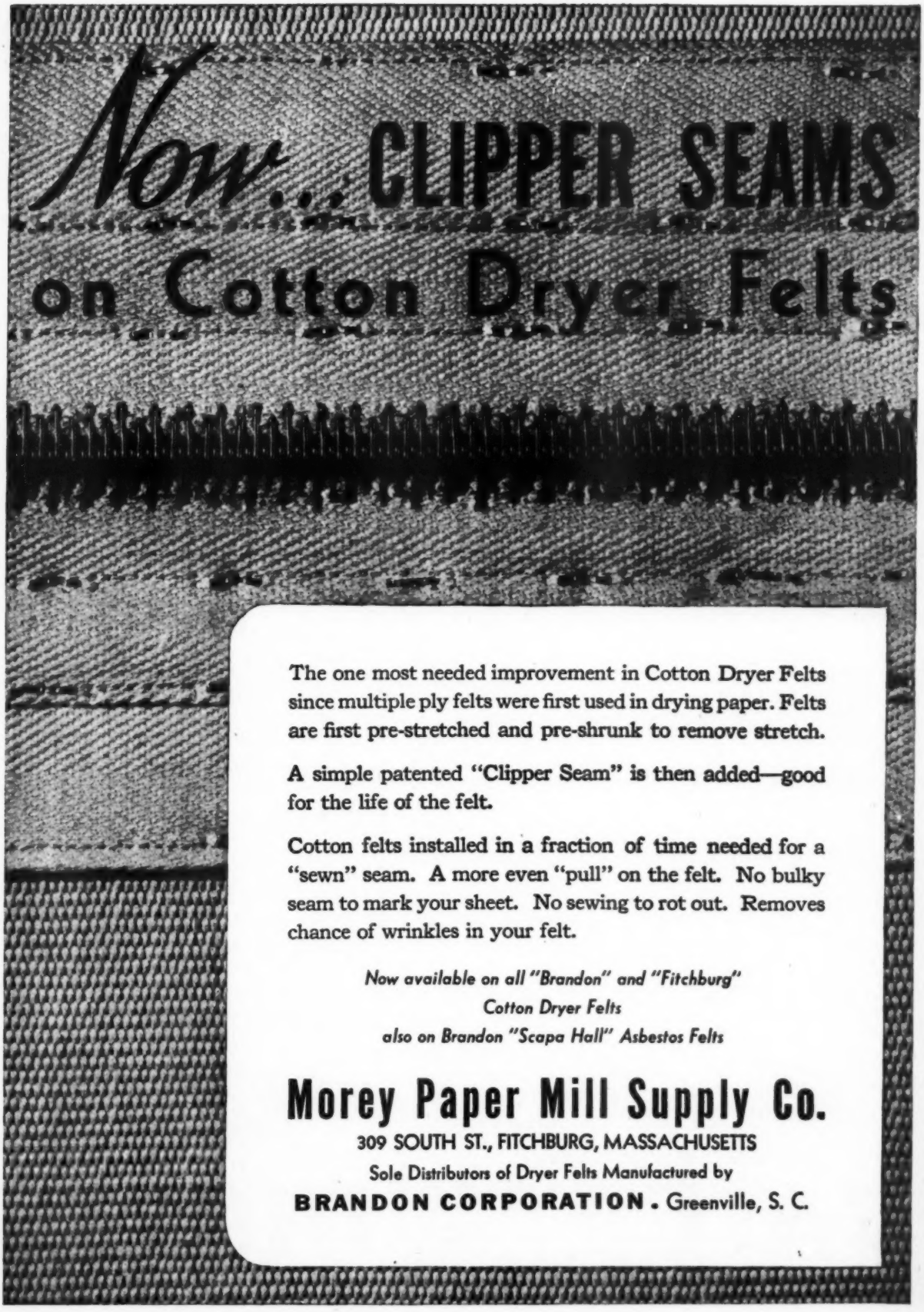
BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy.

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
1165 EAST 283RD ST. WICKLIFFE, OHIO.

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT





The one most needed improvement in Cotton Dryer Felts since multiple ply felts were first used in drying paper. Felts are first pre-stretched and pre-shrunk to remove stretch.

A simple patented "Clipper Seam" is then added—good for the life of the felt.

Cotton felts installed in a fraction of time needed for a "sewn" seam. A more even "pull" on the felt. No bulky seam to mark your sheet. No sewing to rot out. Removes chance of wrinkles in your felt.

Now available on all "Brandon" and "Fitchburg"
Cotton Dryer Felts
also on Brandon "Scapa Hall" Asbestos Felts

Morey Paper Mill Supply Co.

309 SOUTH ST., FITCHBURG, MASSACHUSETTS

Sole Distributors of Dryer Felts Manufactured by

BRANDON CORPORATION . Greenville, S. C.

It's the *SIDES* of a V-Belt That Really Get the *WEAR!*

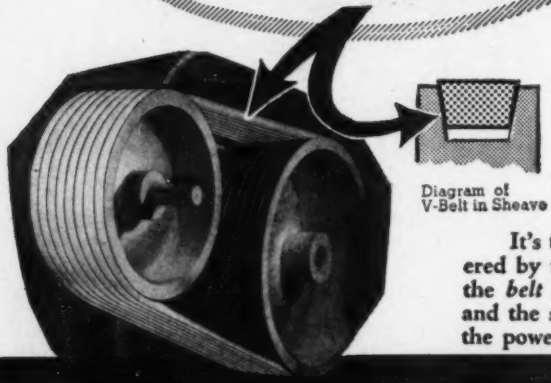


Diagram of V-Belt in Sheave

Look at this diagram of a V-Belt in its sheave. You see at once that the *sides* of the belt do all the gripping on the pulley and get all the wear against the sheave-groove wall.

It's the *sides,* moreover, that pick up all the power delivered by the driver pulley. The sides *transmit* that power to the *belt as a whole.* And then, once more, it's the sides—and the sides *alone*—that grip the driven pulley and *deliver* the power to it.

It's Because the CONCAVE SIDE (A GATES PATENT) Reduces Sidewall Wear *That It Is IMPORTANT to You!*

The fact that the *side* is the part that does the work and gets the wear explains why you have always noticed that the sidewall of the *ordinary* V-Belt is the part that wears out *first.* Naturally, then, when you lengthen the life of the sidewall you lengthen the life of the belt.

The simple diagrams on the right show exactly why the ordinary, *straight-sided* V-Belt gets excessive wear along the *middle of the sides.* They show also why the Patented Concave Side *greatly reduces* sidewall wear in Gates Vulco Ropes. That is the simple reason why your Gates Vulco Ropes are giving you so much longer service than any straight-sided V-Belts can possibly give.

Longer Sidewall Wear Is *MORE IMPORTANT NOW* Than ever before!

Now that Gates Specialized Research has resulted in V-Belts having much stronger tension members—tension members of Rayon Cords and Flexible Steel Cables, among others—the sidewall of the belt is often called upon to transmit to the pulley much heavier loads. Naturally, with heavier loading on the sidewall the life-prolonging Concave Side is more important today than ever before!

Straight Sided V-Belt — FIG. 1

How Straight Sided V-Belts Bulges When Bending Around Its Pulley — FIG. 1-A

You can actually feel the bulging of a straight-sided V-Belt by holding the sides between your finger and thumb and then bending the belt. Naturally, this bulging produces excessive wear along the middle of the sidewall as indicated by arrows.

Gates V-Belt with Patented Concave Sidewall — FIG. 2

Showing How Concave Side of Gates V-Belt Straightens to Make Perfect Fit in Sheave Groove When Belt Is Bending Over Pulley — FIG. 2-A

No Bulging against the sides of the sheave groove means that sidewall wear is evenly distributed over the full width of the sidewall—and that means much longer life for the belt!

4612

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World's Largest Makers of V-Belts

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GATES VULCO ROPE DRIVES

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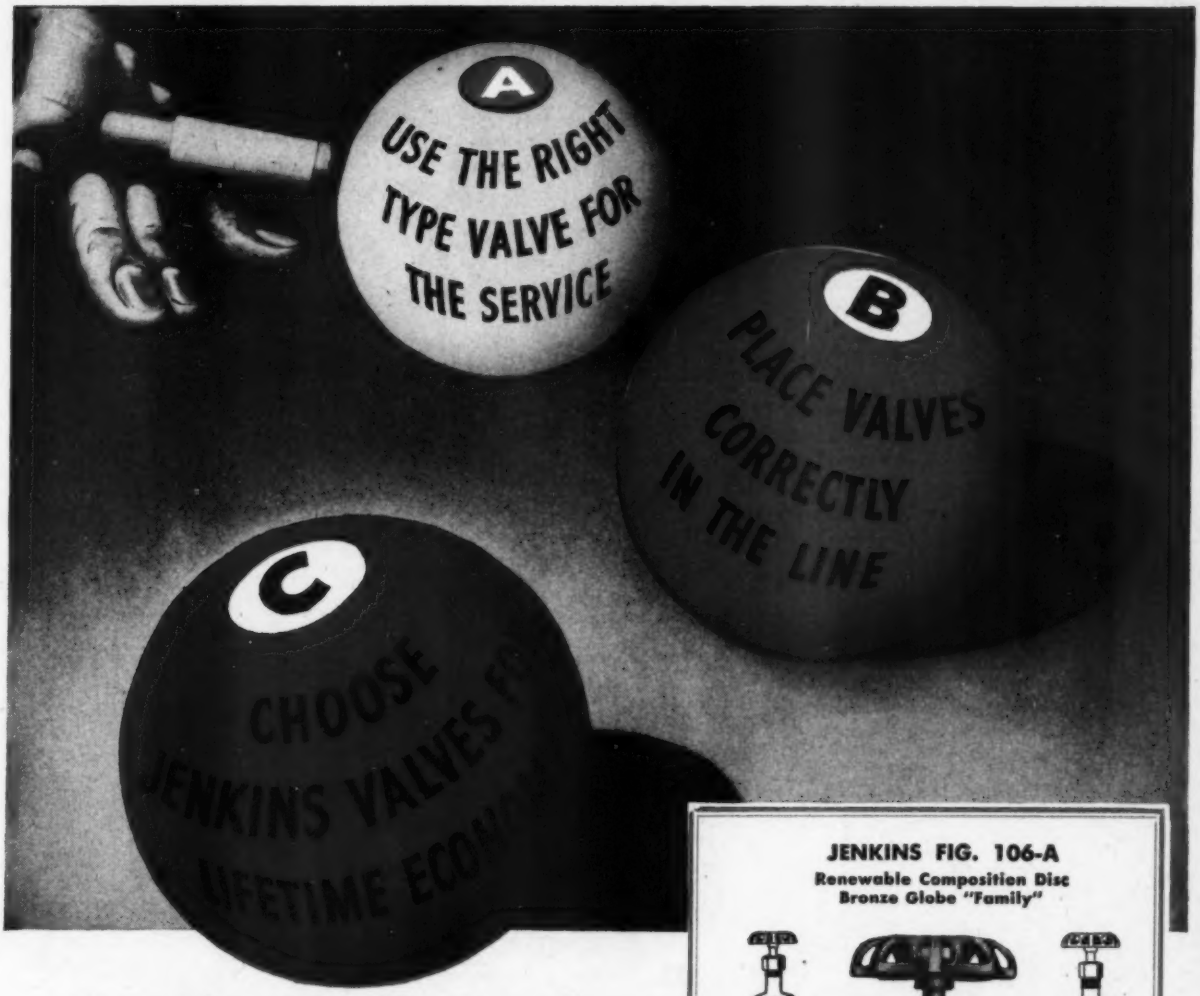

The right angle of approach to lower valve costs

Line-up your valve-buying sights on the Jenkins 3-Point Formula and score money-saving valve economies.

By specifying Jenkins Valves when new valves are needed, you get the product of valve *specialists* whose ability to build *extra value* into valves has been recognized for over 80 years. You also get the experienced assistance of Jenkins top-rated valve engineers on any question of selection or placement.

Base your valve buying on the 3-Point Formula and get *extra* value which means *lowest cost in the long run.*

Jenkins Bros., 80 White Street, New York 13; Bridgeport, Conn.; Atlanta; Boston; Philadelphia; Chicago; San Francisco. Jenkins Bros., Ltd., Montreal, Canada; London, Eng.

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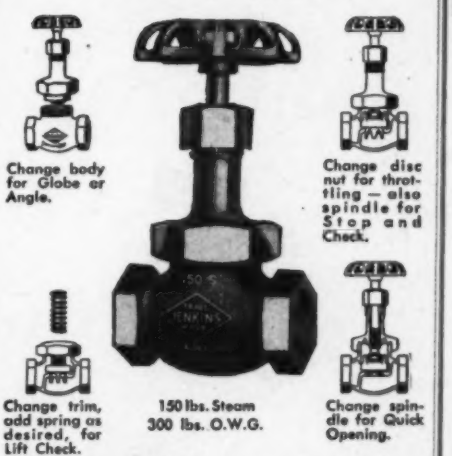
For every Industrial, Engineering, Marine, Plumbing-Heating Service . . . In Bronze, Iron, Cast Steel and Corrosion-resisting Alloys . . . 125 to 600 lbs. pressure

Sold Through Reliable Industrial Distributors Everywhere

JENKINS FIG. 106-A

Renewable Composition Disc
Bronze Globe "Family"


Change body for Globe or Angle.
Change disc nut for throttling — also spindle for Stop and Check.
Change trim, add spring as desired, for Lift Check.
150 lbs. Steam
300 lbs. O.W.G.
Change spindle for Quick Opening.

The Fig. 106-A "family" permits valve combinations for 90% of average needs through interchangeability of parts. With only four body types and a handful of parts, over 26 different types of valves can be assembled. Equipped with the slip-on stay-on disc holder, Fig. 106-A can be restored to good-as-new service in a few minutes.

For economy, versatility, ease of maintenance – Jenkins Fig. 106-A "family" leads the field.

ONE OF OVER 600 *EXTRA VALUE* VALVES MADE BY JENKINS VALVE *SPECIALISTS*

One Source for Everything in Pulp and Paper Mill Piping

Look at this sulphite digester installation. Just one example of what can be done to step up piping efficiency the easy way—throughout pulp and paper mills.

By looking to Crane for all piping materials, you get the maximum benefits of standardization practices. Specifying and buying are simplified. Every piping procedure is easier—from design to erection to maintenance work.

With top quality assured by Crane Co.'s 90-year leadership in the field, standardizing on Crane equipment gives you this 3-way advantage:

ONE SOURCE OF SUPPLY offering the world's most complete selection of valves, fittings, pipe, accessories, and fabricated piping— in brass, iron, steel, and alloys—for all power, process, and general service applications.

ONE RESPONSIBILITY for piping materials—helping you get the best installation, and avoiding needless delays on jobs.

OUTSTANDING QUALITY in every item—assuring uniform durability and dependability throughout piping systems.

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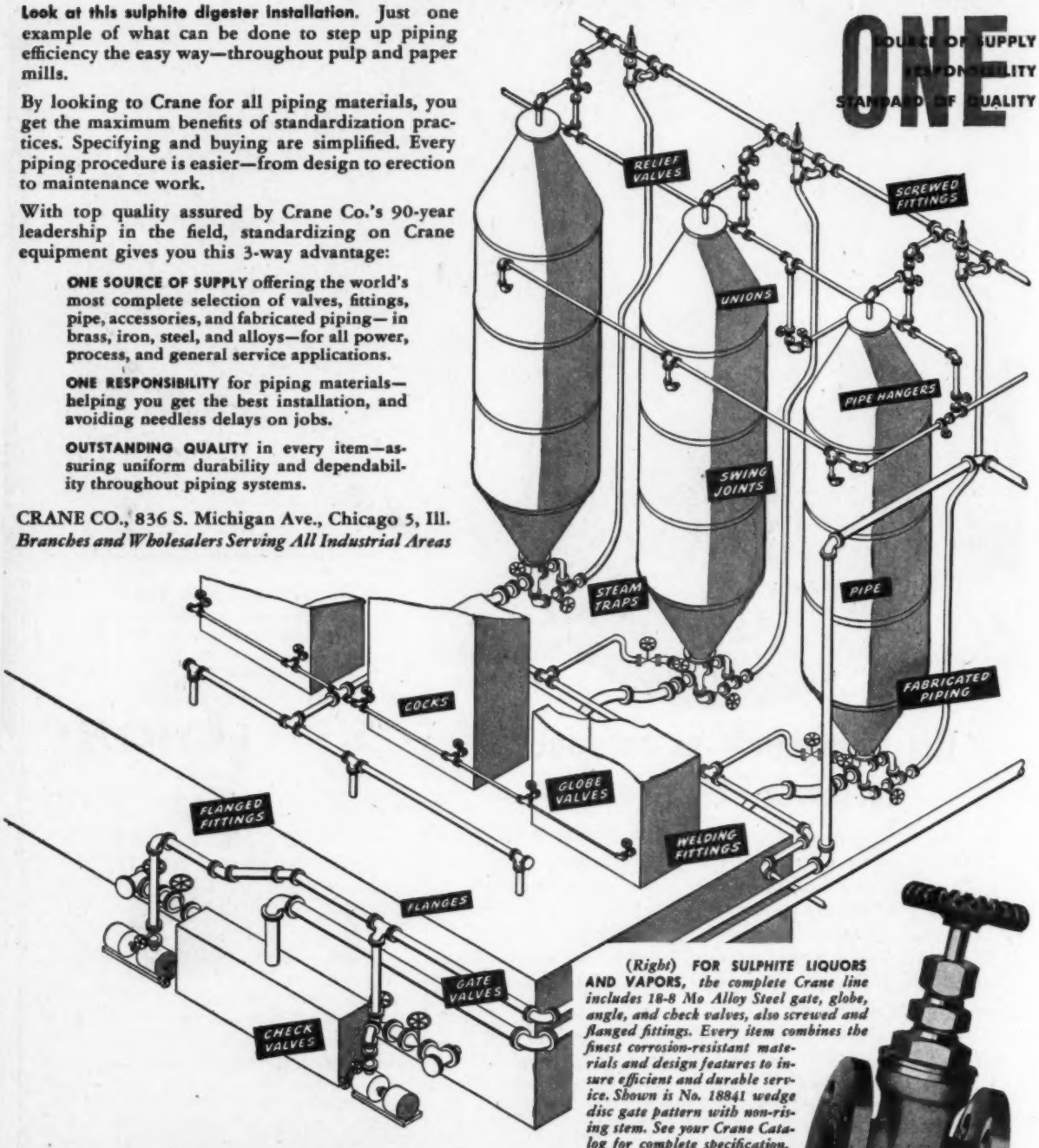

(Right) **FOR SULPHITE LIQUORS AND VAPORS,** *the complete Crane line includes 18-8 Mo Alloy Steel gate, globe, angle, and check valves, also screwed and flanged fittings. Every item combines the finest corrosion-resistant materials and design features to insure efficient and durable service. Shown is No. 18841 wedge disc gate pattern with non-rising stem. See your Crane Catalog for complete specification.*

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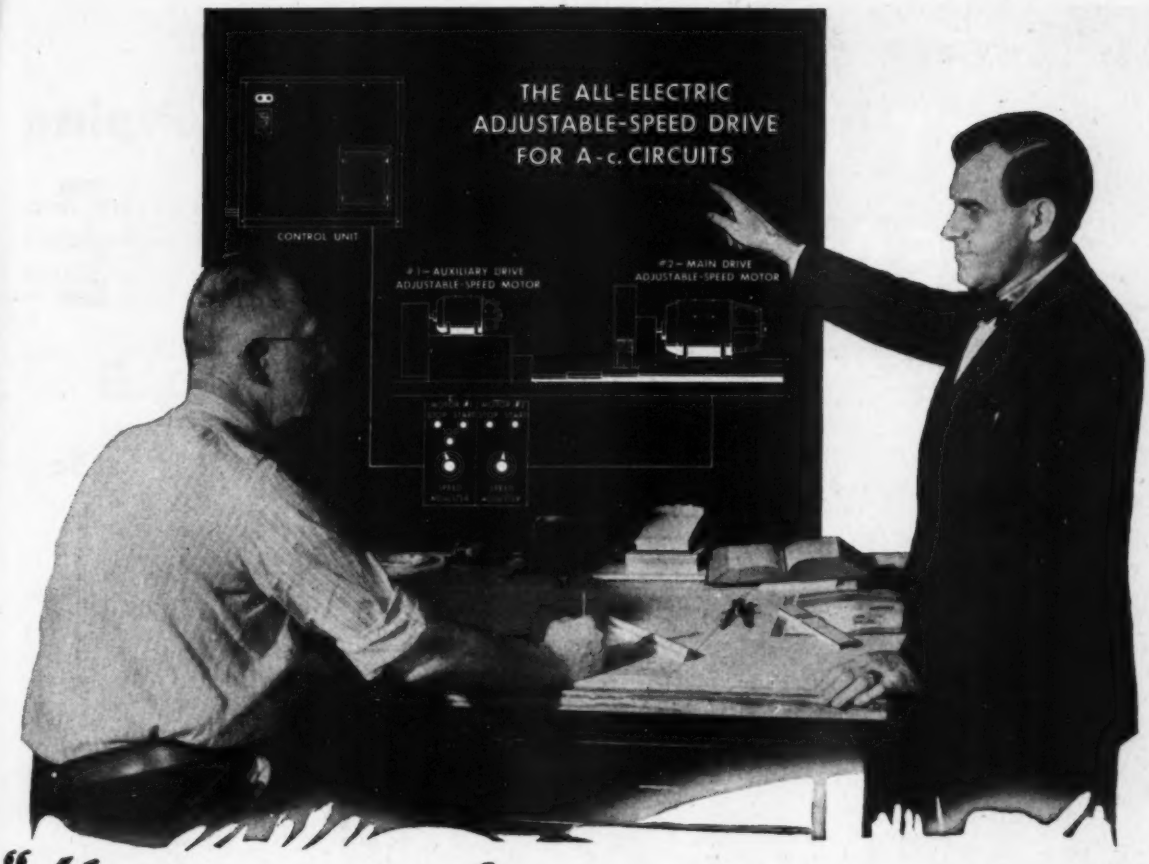

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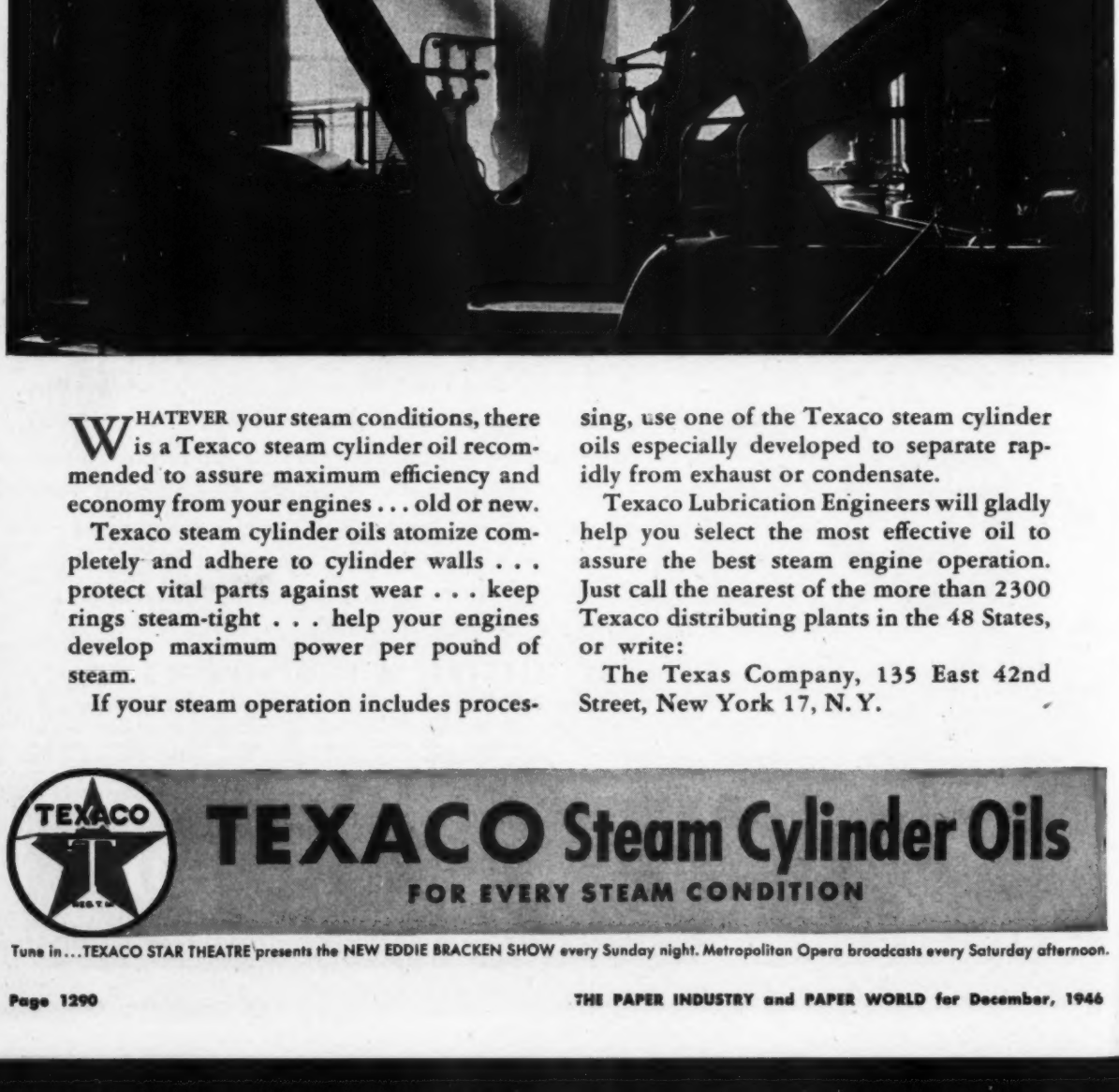

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The Industry Returns to Free Enterprise

▶▶▶ IN COMMENTING upon the probability of complete decontrol of the United States pulp and paper industry, the Department of Commerce reported:

"It should be clearly stated, however, that as of November 8, there is no official information that pulp and paper are among the products and industries now under consideration for decontrol."

However, on November 9, the President announced the decontrol of pulp and paper.

Thus, with unexpected suddenness, the pulp and paper industry regained control of its products after five years of drastic governmental regimentation. November 9 was Saturday: November 11 was a holiday. This gave the operators of the mills a brief opportunity to survey the situation and plan the adjustments made necessary by the sudden transition.

Upon the resumption of business on November 12, without any confusion, but with every evidence of orderly procedure, the pulp and paper industry adjusted its prices and directed its operations upon an orderly and sane basis. Now, after four weeks of free enterprise return, the paper industry is meeting its obligations to its customers and consumers with the utmost endeavor to satisfy everyone. As yet there has not appeared one adverse criticism from those "harbingers of woe" who predicted dire happenings and price gyrations, if and when the industry was ever decontrolled.

Prices *have* advanced. They have all been moderate and reflected only the adjustment of same to a cost plus basis, reversing the crippling, unfair system which OPA foisted upon the industry of "absorption of costs."

The problems which the paper industry faces are many and difficult. The outstanding one is the shortage of raw fiber. The prodigious demand for paper products and lumber for war purposes, new end uses, housings and building has presented an impact upon forest resources, which cannot be met.

Even to sustain present consumption requires constantly augmented imports of foreign pulp and pulpwood. We have been overcutting our depleted domestic forest at a rate exceeding 50 per cent of its annual growth ever since Pearl Harbor. This cannot continue much longer.

Per capita consumption of paper products has been declining for five years. Consumers face further declines. Housings and building are abnormally scarce and have been declining for a similar period. The imports of foreign pulps from Scandinavia are disappointingly low.

Canada has done nobly by us in both timber and fiber imports, but she has reached the point of saturation and no increase for the future can be looked for until new mills are erected there. And, during these past five years, the population has increased at a rate more than twice that of the prewar years in this country. More people consume more paper, in many more uses, every year. The whole-souled effort of the paper industry will be to provide the consumers of its products with every pound of products it can produce from the available fiber.

Economic Illiterates

▶▶▶ A LUNCHEON SPEAKER, a few days ago in talking to a group of business men, appealed for greater appreciation, understanding, and application of the principles of economics by leaders of American industry. The need was emphasized by referring to some of our leaders as a group of economic illiterates.

Recalling college days and the tagging of economics as the dismal science, it is easy to accept this characterization without too much questioning. Specifically, in the pulp and paper industry, for example, the average man has been more interested in getting things done than he has been in ascertaining the economic factors governing them. Competition and rapidly changing technology has forced him to specialize.

This specialization has been essential to the rapid expansion of the industry. Without it, many of the advancements which have come would have been impossible. Yet, with it, there have developed certain definite limitations.

In the old days, the owner of a paper mill was interested, perhaps because he had to be, in every phase of the business—from the purchase of his raw materials and their conversion into finished paper to and including the merchandising of the manufactured product. Sometimes he even went so far as to actually deliver the paper to his customers.

Today, the industry is characterized by a broad division of responsibility. One man is responsible for this operation; another, for that; and so on almost *ad infinitum*. The result is that many men, highly specialized in the work immediately under their supervision or control, know little and care less about the activities of other key men in their own individual organizations.

"I'm not familiar with that phase of our operations," is a statement that is all too common throughout the industry today. Possibly, management is responsible for such a condition. Perhaps, purposely or thoughtlessly, it has kept its key men apart or has failed to furnish them with the spark that would bring them together.

If the economic future of a mill is to be secure, it is believed that every effort should be made to keep all avenues of communication open. The forester should become more interested in problems of mill research and production. The research and production executive should know more about the problems of wood supply and the end uses of paper. The sales executive should learn more about the technology of paper and the ability of his mill to produce papers to meet definite needs. All in all, key executives should develop a broadened interest base and should seek a better understanding of the underlying economics of the entire industry.

The Sins of the Fathers

WILLIAM SIBLEY

". . . visiting the iniquity of the fathers upon the children unto the third and fourth generations . . ."

▶▶▶ CURRENTLY we are experiencing the truism of that passage from the second commandment through suffering brought upon us by the present-day management of our labor unions. The damaging teachings of Lewis, Murray, Reuter, et al, are merely the result and reflection of the "good old days" when industrial management was in the saddle and owned the whip.

It is impossible to talk in terms of either management or labor without calling names of individuals. However, such names are only symbols—marks for the organizations they represent.

There are yet many of us who can recall the management methods of Boss Tweed, Judge Gary, Harriman, Jim Hill, J. P. Morgan, John D. Rockefeller, and other similar industrialists who played stellar roles in the development of this country. Some of us still smart under the sting of the "Public Be Damned" policy of the old New York, New Haven and Hartford Railroad. Many of us can recall the lying advertisements of certain medicines which appeared before the passage of the Pure Food and Drug Act. Thousands can remember the various sorts of swindles which were foisted on the public by unscrupulous J. Rufus Wallingfords.

My father started to raise his little family on a salary of $26 a month, and he had to work twelve hours a day, six days a week, to earn it. He was "docked" when sick or absent, yet rarely compensated for overtime, of which there was considerable during the heavy harvest season.

An easy-going fellow, he was frequently imposed upon in ways that compelled us kids to wear the uncle's castoff suits which mother busheled down to make them fit. A single instance comes to mind. Dad was, at one time, employed by the Atlas Lumber & Grain Company as manager of one of its yards and grain elevator. Salary, $75 per month. While there he was offered the managership of a grain terminal in Sioux City at a salary of $125 per month. So, being a rolling stone anyway, Dad took the offer and moved the family to Iowa. But somehow, in some sort of way, when Dad got down to Sioux City and started to work, the $125 was cut back to $90. And there he was, with a family to support—quite helpless to do more than protest rather weakly.

Regardless of what he may be now, or the degree to which his original sincerity has decayed, John L. Lewis undertook his mine workers job as a crusader. He worked in the pits and knows what it means to be shoved around by simpering straw-bosses who cow-tow to the superintendents. He knows the backaches and the blistered hands which result from inefficient tools and penurious operating methods. He knows what his father—a miner before him—endured, much of which was both needless and harmful.

What John L. Lewis is doing to the nation today, and has done in the past, is the direct result of what was done to him and his contemporary miners in years gone. Unfortunately, he has gone about his job in a very un-American way. He has constantly been an obstructionist instead of a constructionist. Rather than work tooth and nail for mine mechanization and thereby take much of the backache out of coal production, he has limited production and stifled initiative. His policy has grown into one of retaliation and revenge instead of increased production by mechanical methods, which would result in lower costs to the ultimate consumer and better working conditions for the miner.

Surely there is some way to govern such men as John L. Lewis. Surely just and equitable laws could be enacted which would prevent men of his type from gathering and holding such excessive power and influence. A serious coal shortage at this time not only cripples needed industrial production, but totally eliminates many synthetic products such as plastics, textiles, rubber, etc. Indeed, far more than this, it can have a pronounced effect on next year's agricultural crops. This is the season when fertilizer manufacturers make their product for sale and distribution next spring. Little coal; little fertilizer. Little fertilizer; little crops. Little crops; high prices because of scarcity.

Such power (and power that can still be exercised from behind prison bars, if necessary) in the hands of one man, or even a small committee, makes for dictatorship, minority rule, and war. It is as totally un-American as the ancient "Public Be Damned" policy.

As some folks see it, the only way to eliminate periodic strikes and turmoil with the United Mine Workers is first to outlaw the check-off. If that gruesome device could be killed, the Unions would immediately go back to their old standards of being able to sell memberships and collect union dues from only about one-third of the present union membership. Another thing that should be done is to force the Unions to incorporate and enjoy all the benefits and responsibilities of incorporation. This would automatically force the Unions to pay income taxes, which they should do, being such Big Business within themselves. Those are "Big Stick" measures—but back in Teddy Roosevelt days it took such measures to make management behave. Let's swing the Big Stick on unruly Labor now in the interest of public welfare.

They're all exactly alike in size, shape and quality of bronze. But there's a mighty important invisible difference—the *alloys*.

That slight change in composition—often only a fraction of one per cent—can make a huge difference in service. Through years of research N-B-M has perfected scores of "minor" variations for different requirements which give bronze bearings and parts far longer life.

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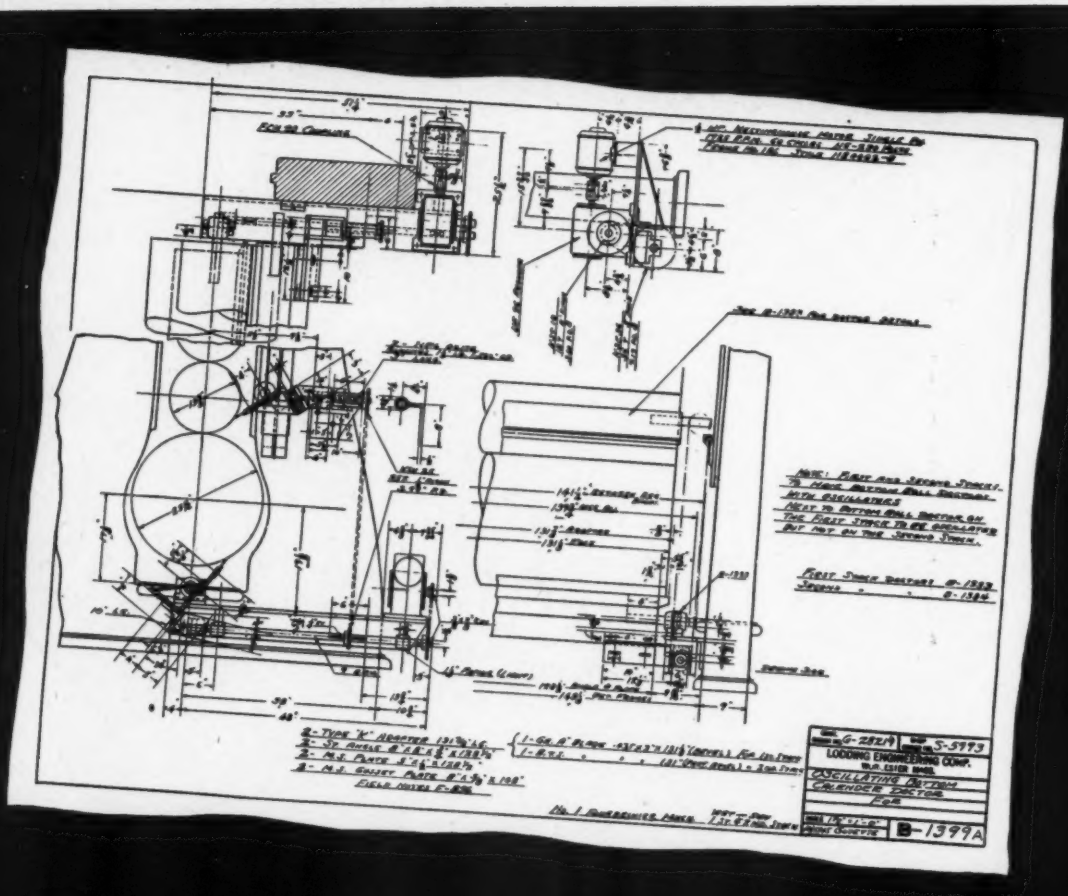

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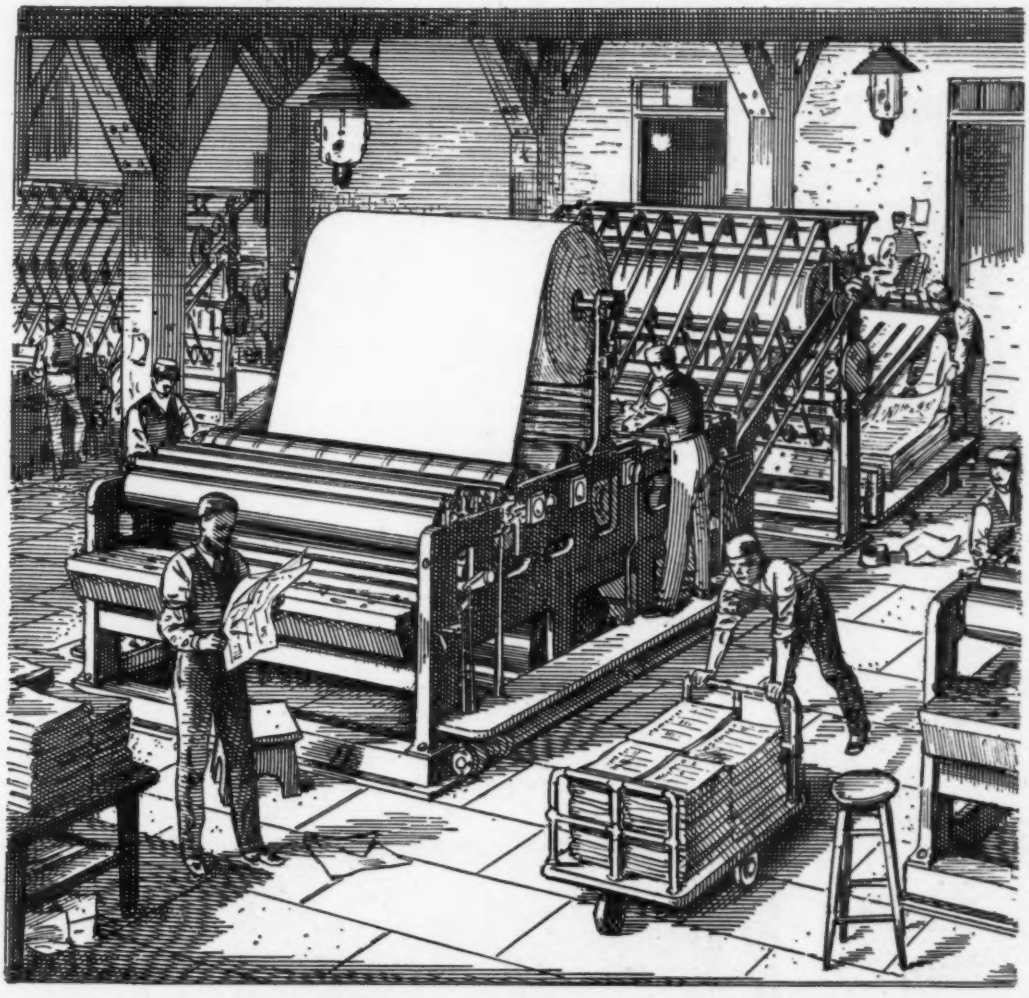

The Magic Machine that Made Man Free

Just as the wood-pulp process made paper plentiful, so the cylinder printing press, a seeming giant in the '70's, gave new wings to the printed word. Since then, the publishing industry has miraculously improved its equipment in speed, capacity and efficiency. It turns out more than 40 million newspapers every day, more than 30 million Sunday newspapers, more than 14 million weekly newspapers. Its presses roll out ever increasing millions of farm papers, business papers, weekly and monthly magazines. Books, once so rare they were handed down like a family heirloom, are now produced at the rate of 200 million copies a year.

Plentiful paper and the printing press have made Americans an informed and thinking people; have brought them a knowledge of the sciences and the arts; have placed culture upon the table of the common man.

The dramatic story of paper is told in the sound-and-color film, "Paper—Pacemaker of Progress," and in a book under the same title. Both are presented by F. C. Huyck & Sons as a tribute to the Paper Industry. The book will be sent free upon request.

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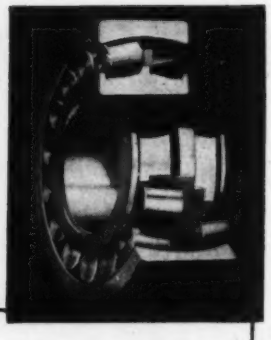
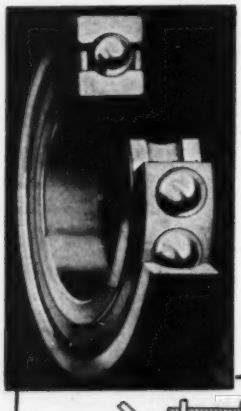
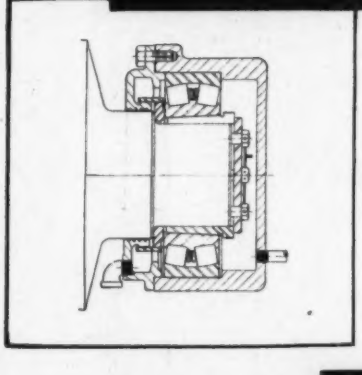


← HIGH RADIAL AND THRUST CAPACITY

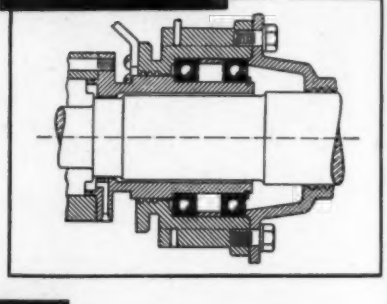
when loads are heaviest are assured by Torrington Self-Aligning Spherical Roller Bearings under all conditions of shaft deflection or misalignment. The taper bore type shown here is mounted with a tapered sleeve for shaft positioning, simple mounting practice and control of internal clearances. Unit construction provides thrust capacity for normal thrust loading from shaft deflection.





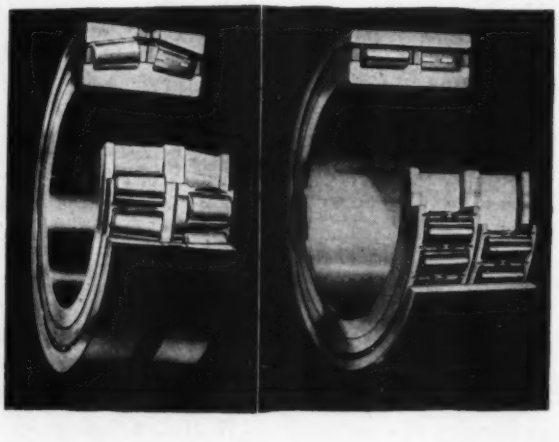
HIGHLY SENSITIVE OPERATION →

with less drag on felt rolls and longer felt life, is secured by the use of Torrington Stainless Steel Ball Bearings in the Beloit Air Guide Regulator. Installed in the vertical felt run of a dual press, these bearings are matched in pairs and have retainers of micarta. Engineered to match the long service life of the machine, they operate smoothly with minimum maintenance.



GREATER TONNAGES →

can be easily rolled out at high speed when Torrington Two-Row Tapered Roller Bearings are used. Advantages include uniform caliper, ideal printability, higher speeds, longer roll life, minimum starting torque, minimum lubrication, assured alignment, axial roll stabilization and less downtime.



← UNIFORM LOAD DISTRIBUTION

under conditions of roll expansion and contraction is assured when Torrington Straight Roller Bearings are used on the floating end of paper machine bottom rolls. Built to take high radial loads safely and surely, these bearings operate at high speeds with a minimum input of power required.

Shown above are typical Torrington Bearings for a variety of applications to paper mill equipment, where they contribute to higher production with minimum maintenance costs. Torrington's Bantam Bearings Division has had years of experience in designing and building bearings for special and routine requirements. Our engineers will gladly help you adapt Torrington Bearings to your specific needs.

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SOUTH BEND 21, INDIANA

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For pointers on Heat-Treating Stainless

consult EASTERN!

Softening 18-8? How long should 10-gage E-S 18-8 (Type 302) sheet be held at heat to soften it between deep-draws? Can it be heated in a salt bath?

Oil-Quenching? Will oil-quenching make E-S 18-12 Mo stainless (Type 316 plate pick up carbon and lose corrosion-resistance?

25-20 Hardenable? To what Brinell can we harden E-S 25-20 chrome-nickel steel (Type 310) blades by heat-treatment? Can they be case-hardened?

Stress-Relieving? What heat-treatment do you recommend for stress-relieving titanium-stabilized stainless (Type 321) sheet after welding?

Burn Off Oils? Will the soluble oils used in drilling E-S 18-8 (Type 304) plate burn off without affecting it when the plate is heated to anneal the hard spots?

Minimizing Scale? How can we reduce scale formation when annealing light E-S 17-7 stainless (Type 301) sheet? We now hold it at 2,000° F. for 15 minutes

When questions like these come up in heat-treating stainless sheet or plate, take advantage of Eastern Stainless technical service. Stainless isn't temperamental, but procedures must be correct for it to give its best service. Send us your question—no matter how simple or complex—and you'll soon find that Eastern has the right answers where stainless steel is involved. And you can get those answers fast—by phone, telegram, or return mail, as you wish.

Many of the answers are already at your fingertips when you have a copy of our catalog, "Eastern Stainless Steel Sheets." Write for one today.

Ask Eastern for the Answer when Stainless is the Question

EASTERN STAINLESS STEEL CORPORATION

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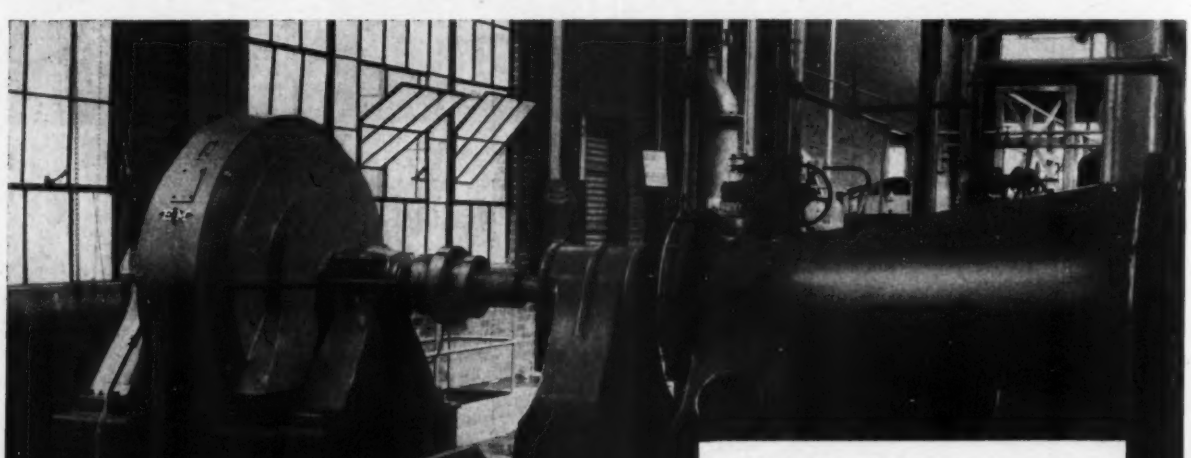
Paper Mills get DOUBLE VALUE from E-M SYNCHRONOUS MOTORS



350 hp, 400 rpm, splash-proof E-M Synchronous Motor drives jordan and improves power factor in a large paper mill.

VALUE 1—E-M SYNCHRONOUS MOTORS PROVIDE THE MOST EFFICIENT DRIVE

You can't select a *better* motor for a jordan drive than a "built-for-the-job" E-M Synchronous Motor. Direct-connected to the jordan, these high-torque, easy-starting motors provide smooth, powerful, constant-speed operation unaffected by load or voltage variations. Because they operate at high efficiency you get the lowest power cost . . . because of their rugged construction you get the long life, dependable motor service you need for trouble-free jordan operation. Splash-proof and drip-proof protection is available for wet locations.

VALUE 2—E-M SYNCHRONOUS MOTORS OFFER EXTRA ECONOMY IN IMPROVED POWER FACTOR

Because they are built to operate at *unity* or *leading* power factor, E-M Synchronous Motors on your jordans can *help reduce your power costs and improve the efficiency of power system.* This is a plus-value in performance in addition to the drive. It helps compensate for low power factor caused by other motor drives . . . helps you maintain unity power factor in mill.

E-M field engineers are specialists of long experience in synchronous motor applications. They can help you take most advantage of these high efficiency motors in *your* mill.

And here are other ways your mill can use

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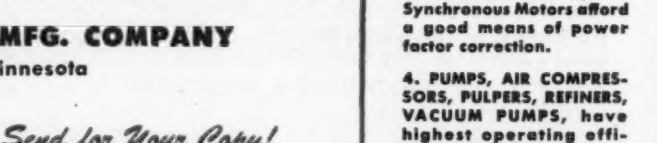

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The Ethics of the Research Worker*

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▶▶▶ THE QUESTION once arose as to what professor at Columbia University had had the greatest influence on my life. Naturally a number of great names came to mind. Charles Frederick Chandler, Marston Taylor Bogert, both great chemists and teachers, Cassius Keyser, an eminent mathematician, Charles Beard, the historian, and a number of others. All of these men had been my teachers. I had met them in the class room, the laboratory or the lecture hall, and all of them had left their impress.

But strangely enough, the man who influenced me most was one whom I had never even seen at Columbia. In fact I saw him only once or twice in my entire life, and I attended none of his lectures. However, later, I read many of his lectures and his essays, which helped me to crystallize my own ideas because of the clarity with which his ideas were expressed. Who was this man? His name was Felix Adler. He was professor of political and social ethics at Columbia University. The fact that I hardly knew Professor Adler seemed unimportant. His personality and idealism could be sensed in each of his publications, and I followed with interest all of his great civic contributions that showed how completely he was putting his ideals into practice.

Many years after leaving college (some 23 years ago) my old friend Dr. Emmet Reid, of Johns Hopkins University, outlined a book entitled *Introduction to Organic Research*. He sent this outline to a number of chemists, including myself, and asked for suggestions. I noted one omission. Nothing had been said about the ethical side of research. Dr. Reid immediately asked me to write a brief section on this subject for his book and this I did (*2*). As I look back after twenty-three years, and reread this section, my limitations in this field become all too apparent. True I emphasized the personal integrity of the research worker, but placed no emphasis on his social responsibilities—and so I side-stepped issues which appear very important to me today.

Ethics Defined

What do we mean by the term "ethics"? Professors of philosophy speak of ethics as a systematic study of the ultimate problems of human conduct (*1*). The term ethics comes from the Greek—either from the word denoting *character* or the word meaning *custom*. It has to do with the morals of the human race.

Of course, such conduct may be studied from various points of view.

It can be observed externally and objectively—just the way the behavior of the lower animals is studied. (This would place it within the field of behaviorism and biology.)

It may be studied in relationship to the mental processes involved in such conduct. (This would put it in the field of psychology.)

It may be studied in its relationship to the social and physical environment in which man lives (in the range of anthropology and sociology).

All of these studies have their value and their importance to ethics. However, they are not ethics. As I understand it, the problem of ethics is entirely different. Ethics is concerned not with the bare facts of human conduct, but with certain intangibles—with values, and with estimates and potentialities.

One cannot measure ethics by means of instruments or mathematical derivations. Nor can one draw neatly tabulated data or pretty graphs. As practical an industrial scientist as Irving Langmuir (*3*) says "—even the scientific analysis of the principle of ethics has not proved particularly fruitful.—Let us not restrict (ourselves) by trying to regulate our lives solely by science and by reason." In other words, ethics is not a positive, objective science. It deals not with *actual* human conduct, but with its *ideal*. It has to do with human conduct not as it *is*, but as it *should* be. Moral values, gathered over the centuries, play an important role in ethics.

The ideal view is taken that human beings are capable of rising above time-honored prejudices, ingrained case-hardened custom, and of reaching a plane which transcends the limitations of human beings as we know them today. Pessimists will tell you that all this is unrealistic wishful thinking. That is a point of view to which I cannot subscribe.

Naturally philosophers who are interested in ethics cannot always agree on what these ideals should be. They may meet on common ground for a short time—but eventually their viewpoints will differ. Often traditional morality is accepted. Not infrequently its validity is questioned. When the questioning is tinctured with a philosophy of material nationalism (as in the case of Nazi Germany), the results are devastating. I shall try to raise a few of these questions today—but first I want to discuss with you what I hope is an acceptable ethical position for the individual research worker, or, for that matter, for any man doing creative work in

(*) An article expanded from a lecture given at the Seminar of the Institute of Paper Chemistry, Appleton, Wisconsin.

any form. Most of this seems self-evident and elementary.

Truth and Research

(1) A research worker must at all times seek the truth, and his honesty must be above suspicion. Attempts to defraud are naturally outlawed.

Due Credit

(2) He must give due credit to his co-workers, and his colleagues for any share that they may have had in the work. He must be punctilious in giving proper acknowledgment to previous investigators in the same field—to those men who have blazed the trail.

Tolerance

(3) He should free himself from pettiness. If his own prior work has been overlooked, he should view such neglect charitably, with good humor and without cynicism. Often this lack of recognition is due to carelessness rather than to deliberate, planned neglect. As a corollary to this, the research worker should not permit himself to become embittered or involved in useless polemics. This does not mean that he should not take issue with a misinterpretation of data or with the mistakes of other investigators. It simply means that his criticisms must be objective, and that they must not descend to the plane of personalities. He must show that he is dealing with a set of data, not with an enemy.

In 1927, I was in Berlin, and within this area lived three chemists eminent in the field of cellulose. They were Hans Pringsheim, Professor at the University of Berlin, Kurt Hess, Director of the Kaiser-Wilhelm Institute für Chemie, and R. O. Herzog, head of the Kaiser-Wilhelm Institut für Faserstoffchemie. I liked them all, but I found that Pringsheim and Hess were not on speaking terms. Hess and Herzog never greeted each other, and Hess and Pringsheim were certainly not friendly. Their scientific disagreements had led to bitter feuds, and none of them had the sense of humor to break the deadlock of these animosities. I sensed this rankling hostility when I visited each chemist in turn, and I was chilled by it.

So my contention is that the research worker must be willing to take constructive criticism and vigorous disagreement without enmity and without hypersensitiveness.

Collaboration

(4) The research worker must stand ready to help others with advice and with materials. His true objective is not to further his own progress but that of science. Therefore, he should be willing to co-operate whenever possible, and help should be given unstintingly. Human relationships are important in modern scientific research, and mutual trust and exchange of ideas are essential. There are times when such frankness leads to disappointment and to disillusionment—but the scientist who lives as a recluse, or who constantly fears that someone will "steal" his brain children is a sorry creature, who fails to get the maximum enjoyment out of his work.

Self-Criticism

(5) It goes without saying that a research worker must exercise the greatest critique toward his own work. Not infrequently working hypotheses are accepted as facts, and when experimental data do not agree with the hypothesis, the uncritical worker becomes a victim of his *a priori* judgments. The hypothesis rides the man—and sometimes it serves to embarrass him. Any working hypothesis should be discarded when it no longer accounts for carefully weighed experimental data. Many of the principles that I have outlined are self-evident, and yet they are overlooked by some able scientists, whose influence and repuations would have been enhanced if they had lived up to them.

I have a number of examples of ethical and unethical conduct—but I will cite only two incidents to illustrate some of the points mentioned above. The first is very obviously an example of unethical behavior. The second shows a different picture.

Episode "A"

A professor submitted a manuscript to a colleague interested in the same field of organic chemistry. The professor asked for a critical evaluation of his work, which the colleague gave to the best of his ability and without reservations. In the letter, conveying these criticisms to the professor, the colleague stated that there was still one phase of the work which required reinvestigation and extension and which he, the colleague, hoped to undertake at the earliest opportunity (presumably the following summer). The colleague showed how the results of such a study would have a real bearing on the conclusions reached in the professor's article. The professor acknowledged his colleague's criticism but said nothing about the colleague's proposed work. A few months later, however, at a scientific meeting the colleague was surprised by a report given by the professor on the very problem that had been outlined in the colleague's letter.

A possible (and charitable) interpretation of the episode is that the professor thought of the same problem and had actually begun the work before the receipt of his colleague's letter. Under the circumstances it behooved the professor to notify the colleague immediately that the work was already in progress in the professor's laboratory. A less charitable interpretation, however, puts the professor in a far uglier position. The colleague's letter may have actually *suggested* to the professor the importance of the reinvestigation, in which case the professor deliberately stole the colleague's idea. Under any circumstances the professor's methods were entirely unethical and deserve the fullest condemnation.

Episode "B"

The other instance is in striking contrast to the preceding one. Two investigators were engaged in a piece of research in a government laboratory. Incidentally they learned that two other investigators, while working on a broader problem had covered a part of their own field. This information led to a friendly correspondence which indicated that the work of the latter investigators had progressed farther than that of the former investigators. The latter investigators, therefore withheld publication of their own results until the others could publish a preliminary report of their own work, thus giving them priority. Subsequently the former investigators published an article confirming the latter investigator's results.

The conduct of the government chemists in the matter requires little comment. They allowed the results of their colleagues to be published before their own because they recognized not only a valid claim to priority, but because they felt that the other investigators had a better grasp of the subject than they had themselves. They realized that the chemical literature would gain by a presentation of the results at the hands of the other investigators, rather than at their own.

In case of doubt, when an ethical question arises, the investigator must remember that he must resort to what he considers *right, not expedient acts.* He must take a *detached* view of the situation and ask himself—"What course of action will be the *right* one, *irrespective of its effect on me, personally.*"?

Social Responsibilities

Now we approach more controversial ground. What are the social responsibilities of the scientific worker? Are his ethics involved there?

I think that they are deeply involved. Ideally the ethical man behaves in the best interests not of one small group, but of humanity as a whole. Eventually his results may benefit the most underprivileged coolie and the most primitive savage. So it is my belief that the research man should show the greatest interest in just *how* and *where* his results are to be used.

Not long ago, the American Chemical Society adopted a slogan that became an annoying cliché. It was "Science Is Power." That was true enough, but was entirely inadequate. Power for *what?* For good, for evil? Power to help a confused world? Power to buffer a despotic and grasping minority?

All that we have to do is to look at the brutal technical achievements of certain scientists—the gruesome experiments in certain concentration camps—to recognize the importance of a social conscience. The research worker can no longer immure himself in the laboratory. He *must* care *for whom* and *under whom* he works. It is very much his concern to know how his data are being used or abused. He must realize that it makes a difference whether these data are benefiting the many or the selfish few; whether they are being used constructively or destructively.

During the war years, there were a number of scientists—eminent and honest men—who refused to have anything whatsoever to do with the war effort. I understand that one of my old professors was among this small minority. What about them? Have we a right to label them crackpots, saboteurs, fifth-columnists, or any of the usual appelations with which we refuse to recognize fundamental issues? If we did, we would be running counter to our own democratic traditions. These men were conscientious objectors, with whom most of us disagreed. They made a highly unpopular decision. On the other hand, they acted in accordance with their individual consciences. Here, you see, is a controversial, ethical question. Were these men behaving in the interest of humanity? At present most of us would say "No!" At some future time we might find that they were justified. Following the war, certain scientists disagreed sharply with what appeared to be a military or political trend. Professor A. V. Hill (*4*), Foreign Secretary of the Royal Society of London, speaking last May before the George Westinghouse Foundation Forum on *Scientific Ethics* said: "We in England have recently watched with admiration the example of strong and courageous initiative taken by certain American scientists in refusing to be coerced or conscripted against their conscience. I say to you the same determination exists elsewhere. As free men we are all unwilling to be used as pawns in the game of international power politics—to consent in advance to the exploitations of science for secret purposes that we may not approve." The importance of the social conscience of the scientist is gaining dramatic recognition from some of the greatest leaders of science in America. Harold Urey, the chemist, Nobel prize winner and professor at Chicago; Harlow Shapley, the brilliant director of the Harvard Astronomical Observatory; Isaiah Bowman, the great geographer —president of Johns Hopkins; Edward Condon, director of the Bureau of Standards; and Professor A. J. Carlson, the eminent physiologist of the University of Chicago, have all made their pleas in the hope of stimulating fellow scientists to their great responsibilities. Many others have spoken, giving due warning of the necessity of international solidarity. I advise all of you to read *One World or None* (*5*) in which Langmuir, Oppenheimer, Einstein, Ridenour, and others have presented their reports on the atomic bomb. I cannot quote from all of those who are striving to awaken a social conscience. Let me give you an excerpt from a brief article by Dr. Shapley, the famous astronomer (*6*). He says "Do men wish to devote the products of their ingenuity to human welfare? The answer, of course, is in the affirmative. But these inventive men of good intention must overcome serious obstacles that are inherent in our social system. Otherwise their creations are futile. In the capitalistic order, which we have found very suitable for the development of our new country, we emphasize the merit of dollars in large quantities. In consequence, the chief obstacle for the one who would invent not for riches but for the welfare of mankind—is greed. Too few recognize it as an obstacle. In fact individual greed and corporate greed are accepted as a kind of virtue. We do not even like to call greed—"GREED." We prefer words like thrift, wealth—success. And we are inclined to treat as un-American and subversive any talk about human rights transcending property rights."

Evaluation and Tendencies

Dr. Shapley's allusion to greed reminds me of a humorous experience of my own. About ten years ago, when illness kept me in Florida, I received a request from an engineer in the East to give an opinion regarding a technical question. The answer was very simple and required little work on my part. Before I rendered this opinion, I informed the gentleman what fee I expected, and it was a very modest one. I heard nothing further from him until almost a year later when an airmail, special delivery letter with a check enclosed asked for an immediate reply with the opinion. Subsequently he thanked me and stated that my opinion agreed with that of various "experts." And the matter was closed until a friend of mine in Syracuse asked me that summer—"Did X (the engineer) ever get that opinion from you? " I said yes—and told him of the long time period between the engineer's first query and his final request. My friend said, "Wise, you're a fool! It was I who suggested that X get in touch with you in the first place. So he wrote to you. When I saw him months later and asked whether he had ever heard from you, he said—'That man Wise *can't* be any good! You know what he asked me? *Ten bucks for an opinion!* That alone shows that he's incompetent to render an opinion on the subject.' " Finally my friend persuaded the engineer to get my opinion despite this ridiculous charge. So that accounted for the delay, the special delivery letter, and the check. I recount this simply to show that in certain quarters a man's value is correlated not with what he can produce but with what he can squeeze out of the other fellow—a concept which neither Dr. Shapley nor I find palatable or ethical.

Dr. Carlson, the physiologist, in his speech as the retiring president of the American Association for the Advancement of Science (*7*) says: "Despite differences in skin, color, anatomic details, language, culture, and religions, *the present human race on the face of this earth is biologically one human species.* We have no sound scientific basis for the belief or superstition of superior or inferior races."

This is a powerful arraignment of racism and of extreme nationalism and it is one that no thoughtful worker in the field of science can afford to ignore.

Director Condon says (*8*), "Mankind has brought down suffering and death on his head; spiritual values have been destroyed; hatreds have been nourished and developed into great social cancers by fears, war and war suspicions and divisions among men. This has been going on since the beginning of time and will surely destroy us all if we let it continue. *This must stop!* We say there is such a thing

as progress toward a higher level of development. With all the stumbling and fumbling, we see an upward trend throughout human history."

Not all men of science respond to their obligation to society in this stirring fashion, and I want to quote from another scientist, whose coldly hopeless fatalism is in sharp contrast to the words of Dr. Condon. This is Professor Leslie A. White (*9*), an anthropologist of the University of Michigan, who said last December: "As for the extermination of the human race as a consequence of hurling atomic thunderbolts, this too may be admitted as a possibility, and all we can say is, that if it *is* to come, it *will* come. Extravagant expressions of horror will not alter the course of events."

To him, Dr. Condon (*8*) says—and with justice—"We should not fantastically await death, reading papers to an academic society in a museum in Philadelphia." Needless to say, I agree strongly with Dr. Condon, and I disagree heartily with Dr. White. Defeatists, like Dr. White, do not recognize that "atomic thunderbolts" are hurled not by inexorable laws of nature, but by man.

An excellent article by Dr. Melvin Rader (*10*) of the University of Washington shows what a thoughtful philosopher envisions. He treats of *Science and the World Community*. He shows how Darwinian concepts, when applied to society as a whole, were frequently used to support predatory behavior and to oppose social reform and humanitarianism. Furthermore, imperialism and human exploitation were often rationalized by the high priests of Darwin. I should like to quote briefly from Rader's article, because he expresses not only what is in my own mind, but what the more sensitive scientists of America feel about the human family.

"At the 1940 meeting of the American Association for the Advancement of Science in Philadelphia, there was a symposium on 'Science and Ethics' in which some of America's most distinguished scientists, including a number of eminent biologists, agreed that human co-operation is a more important factor in survival than human competition. The more sophisticated biologists, moreover, realize that the life of man in society, although it necessarily rests upon a biological foundation, exhibits many cultural characteristics which cannot be reduced to merely biological terms. The direct study of human society by anthropologists and other social scientists has proven that 'human nature' is remarkably plastic, and that the highly cooperative society of the Arapesh in New Guinea, for example, is quite as 'natural' as the fiercely competitive society of their near neighbors, the Head-Hunters.

"In view of the newer trends in both the physical and biological science, we can say that our tendencies toward community are as innate and as well founded in nature as any of our competitive drives; and that our problem is to keep competition in its proper place, directing it toward worthy ends and subordinating it in, or co-ordinating it with, the even more fundamenal tendency toward organic and communal relationships. The most fruitful kind of competition, such as the friendly rivalry of scientists in the discovery of truth, is the sort that contributes to a common cause and that consequently is not an alternative to co-operation but an aspect of it."

In an oath which all young doctors take just before they receive their medical degrees, they solemnly swear that never will they take undue advantage of their position and that they will always remain steadfast to their great responsibilities to mankind. This is the oath of Hippocrates and it always adds to the solemnity of any university commencement.

Pledge for Scientists

Dr. Gene Weltfish (*11*) feels that scientists, in recognition of *their responsibilities* to the world at large, should take a somewhat similar vow, which runs something like this:

"I pledge that I will use my knowledge for the good of humanity and against destructive forces of the world, and the ruthless intent of men, and that I will work together with my fellow scientists of whatever nation, creed, or color for these our common ends."

The question may well be raised, "So what? We are scientists—not social reformers, not statesmen—what can *we* do about it anyway; we are just helpless individuals." My answer is based on my personal experience and what I have tried to do myself. In writing categorically (as I do), I admit that I personally have fallen short of the ideal.

(1) We have the ballot. Whenever possible we should espouse the cause of ethical, open minded officeholders, irrespective of party. We should render protests when others in office fail to live up to their obligations. In general too we should support in national office, those men who understand trends beyond their immediate State and Country.

(2) We should act as far as possible with those who combat race prejudice, intolerance, and the violation of civil liberties—not simply in the United States but *everywhere on the face of this earth.*

(3) We should act as far as possible to defeat gangsterism and its supporters, irrespective of the guise under which it flourishes.

(4) We should voice our opinions in trying to help settle disputes by law, not war. Specifically we should support the United Nations Organization and the U.N.E.S.C.O.

(5) We should strive to establish cordial relations between the men of all countries, and we should make every attempt to understand the points of view (not necessarily agreeing with them) of the men of other nations.

(6) We should never forget that the entire human race belongs to one species and that no nation is free from destructive agencies, nor can any nation lay claim to perfection or to a race of supermen.

▶▶▶ Much of what has been said above applies not only to research workers. It applies equally as well to teachers, executives, business men, farmers, professional men, artists, and machine tenders, and it calls for steady, dynamic action.

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Reciprocal Trade Agreements

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▶▶▶ RECIPROCAL TRADE Agreement negotiations for reductions of duty rates on imported merchandise will be a paramount problem before the paper industry in the next few months. The industry has already had one disastrous experience with tariff tinkering when newsprint was placed on the free list in 1913. Trade agreements since the drive for lower tariffs began in the 30's have given evidence that the manufacturers of other grades of paper are now being faced by the same danger.

A review of what has happened may be significant of what may come to pass if the Washington low tariff advocates have their way.

In 1909, the United States produced 1,168,000 tons of newsprint paper, with a surplus for export above domestic consumption requirements. In 1945, the United States production was down to 725,475 tons, but consumption rose to 3,350,622 tons. Of this consumption, Canada supplied 2,668,798 tons. In other words, the placing of newsprint on the free list not only has taken a large tonnage out of United States production, but it has enabled Canada to take over the industrial wealth and the employment of labor that might have been ours. In 1913, there were 72 newsprint mills in the United States, but today there are only seven companies making this paper. Computed in dollars, this change in the tariff law diverted approximately $200,000,000 a year to foreign manufacturers.

With the abandonment of newsprint production, several once prosperous industrial communities have become ghost towns. Such towns are Wilder and Fitzdale, Vermont; and Felts Mills and Raymondville, New York.

The effect on industrial communities of tariff reductions can be appreciated when it is realized that every ton of imported paper costs one American paper mill employee three days of employment. The Scandinavian worker receives for those three days the equivalent of one day's pay for an American employee. The effect is passed on to the paper mill community. Approximately half of the American primary industry is located in towns wholly or largely dependent on the business developed through these mills. Fifty-eight per cent of the nation's paper production is in communities with a population of 10,000 or less. The largest percentage of the industry is in towns which are from 70 to 100 per cent dependent on the operation of the paper mills for their prosperity.

A Reciprocal Trade Agreement Act was passed early in the Roosevelt Administration and almost immediately tariff tinkering began. Every grade on which duty rates were reduced felt the impact of this development. The effect on the kraft industry is typical. Under the original rate of 30 per cent fixed by the Tariff Act of 1930, imports were about 4,000 tons per year. The rate was reduced in 1935 to 25 per cent and in 1936 to 20 per cent. Imports mounted to 20,000 tons per year, but were checked later through price reductions (at a loss) by American mills to from 12,000 to 15,000 tons. Losses by sales and in potential loss of employment can be computed easily. The most serious effect, however, was not in the volume of lost business, but in the damage to the domestic price structure. American mills reduced prices until the entire American market of hundreds of thousands of tons suffered losses of over 1 cent per pound in price to meet foreign competition of 20,000 tons at prices far below American production costs.

The kraft picture is paralleled by the effect of duty reductions on groundwood printing papers. In 1931, the duty rate was one-fourth of 1 cent per pound and 10 per cent, but was cut (effective January 1, 1939) to one-fifth of 1 cent per pound and 5 per cent. In 1938, imports of these papers totaled 9,000 tons. In August, 1946, imports totaled about 9,000 tons—the equivalent in one month of an entire year's shipments before this seemingly minor duty reduction. In 1938, United States mills made over 30,000 tons of novel news. In 1945, the total was under 1,000 tons, imports providing the rest. The same trend was evident and is still under way in other grades, such as pencil, tablet, poster, and lower grades of publication paper. Domestic groundwood mills continued in operation, it is true, but no higher grade products, thereby indicating the beginning of grade shifting—so disastrous following 1913—which impinges on book paper production.

With these examples of the results of previous trade agreements, the industry is naturally concerned over the prospect of further similar action on these and other grades. Under the present law, the State Department can enter into negotiations with other countries for a 50 per cent reduction on all the rates in effect January 1, 1945. Kraft, for instance could be cut to 10 per cent; printing papers to the equivalent of about 5 per cent; and other grades proportionately.

As this is written, the Preparatory Commission of the United Nations Economic and Social Council, consisting of representatives of seventeen nations, is in conference in London arranging for a later conference of the entire Council next year. In fact, this conference is laying the groundwork for an immediate negotiation of duty-reducing agreements on a multilateral scale.

Following these sessions, the State Department will give out what is known as a "bargaining list," a compilation of items on which the United States expresses a willingness to negotiate duty reductions. It can be assumed that paper items will be a large factor on this list, as the State Department has set up a special paper commodity division for the tariff negotiations. Until the list is made public, however, no industry will be officially informed of the extent to which it may be affected in future negotiations.

After the bargaining list is disclosed, there will be approximately sixty days given affected industries in which to file briefs on the items affecting them. After the expiration of this period, there will be an interim of probably two weeks before oral hearings are scheduled. A subcommittee for the Committee for Reciprocity Information will be named to take testimony on paper items. After the oral

hearings are concluded, the fate of the industry will be in the lap of the State Department negotiators.

In this entire program there is only one ray of light for the paper industry. While the State Department is declaredly for material tariff reductions, other nations with which this country will negotiate are notably less enthusiastic over a tariff reduction program than our own—in other words, less anxious to receive concessions than we are to offer them. The British Empire does not want interference with its empire preference system. South American countries want import duties to finance their governments; and Australia, for instance, thinks too little attention is being given to labor problems.

In the last analysis, based on past negotiations, sufficient time will elapse between the close of oral hearings and the conclusion of the secret negotiations between nations involved to delay the actual putting into effect of any reductions which may be agreed upon until about July 1947. This delay in itself is a partial defeat for the Washington proponents of the low tariff program who had hoped to make reductions effective before the end of 1945.

Grades of Paper Which Will Be Subject of Negotiations for Reciprocal Trade Agreements*

▶▶▶ THE STATE DEPARTMENT has announced the list of grades of paper which will be the subject of negotiations for Reciprocal Trade Agreements. Practically every grade of paper is named, the only major exceptions being sulphite and kraft wrapping.

Despite assurance that domestic industries would be given adequate time in which to prepare briefs, the final date for filing briefs is now announced as December 21. Oral hearings will begin on January 13. It had been understood that at least sixty days would be granted for the preparation of briefs, but the time allowance has been cut to a little over thirty days.

Paragraph of Tariff Act	Grade of Paper	Present Duty Rate
1401	Uncoated Printing Paper (Book & Groundwood)	1/5c per lb. and 5%
1402	Pulpboard Rolls for Wallboard, not processed	5%
1402	Strawboard	10%
1402	Shoeboards	10%
1402	Roofing, Sheathing, Deadening Felts	10%
1403	Manufactures of Pulp	30%
1404	Tissue weighing less than 10 pounds per ream of 288,000 sq. inches (except copying and bibulous valued at over 15c per lb.)	2½c per lb. and 7½ to 4c per lb and 10%
1404	India and Bible, weighing from 10 to 21½ lbs. per ream	2c per lb. and 10%
1404	Creped Paper, Paper and Pulp Wadding and manufactures of such wadding	3c per lb. and 7½ to 6c per lb. and 15%
1405	Coated Papers (including Coated Book)	5c per lb. and 15%
1405	Fancy Papers, not coated	4½c per lb. and 10% to 4½c per lb. and 20%
1405	1405 Wax Coated Paper	3c per lb. and 15%
1405	Glassine Paper	3c per lb. and 15%
1405	Vegetable Parchment Paper	2c per lb. and 10%
1405	Articles of papers in this paragraph	5c per lb. and 20%
1405	Basic Paper for Blue or Brown Print	20%
1405	Unsensitized Photographic Paper	5%
1407	Writing valued at less than 50c per lb. weighing over 8 pounds per ream	3c per lb. and 15%
1407	Bristol	2c per lb. and 10%
1407	Manifold weighing 8 pounds or over	3c per lb. and 15%
1407	Papeteries	30%
1409	Hanging Paper Raw Stock	7½%
1409	Strawboard including Straw Wrapping	15%
1409	Blotting Paper	15%
1409	Filtering Paper	5c per lb. and 15%
1409	Filtering Paper valued over 75c per lb.	2½c per lb. and 7½%
1409	Paper not specially provided for (Includes such grades as coating raw stock, corrugating media, water leaf)	30%
1413	Paper and Paperboard cut to shape	30%
1413	Paperboard, vat-lined or similarly Processed	$14.50 per ton, but not less than 15% or over 30%
1413	Press Board and Press Paper	30%
1413	Test and Container Boards, with bursting strength over 60 pounds	20%
1413	Manufactures of Paper	35%
1552	Cigarette Paper	45%

The item listed for negotiations, under which the existing rates can be cut fifty per cent, are shown in the accompanying tabulation.

Any interested industry must file ten copies of its brief, one under oath, and at the same time file request that its spokesman be permitted to appear for his industry at the oral hearings in January.

In anticipation of this program, the Import Committee has collected the basic material for use in an over-all industry brief, and for the divisional associations which are affected.

The list of items scheduled for negotiation is so large and present rates already so low that in many grades the State Department proposals closely approach a free trade basis. If such a situation is to be averted, the industry must be prepared to make the strongest possible presentation of its opposition to the Administration proposals.

Representative Knutson, slated to be Chairman of the Ways and Means Committee of the House of Representatives, has already announced that one of the first actions of the new Congress will be to investigate the working of the Reciprocal Trade Agreement Act, as a prelude to definition of a party policy. By the time the new Congress can proceed far on this course, however, the Administration program may be too far advanced to be checked.

(*) This Special Report was issued by the Import Committee of the American Paper Industry under date of November 13.

A Simplified Constant Humidity Room

JAMES d'A. CLARK

▶▶▶ DESCRIPTION OF A ROOM designed by the author appeared in the February, 1931, issue of *The Paper Industry* under the title, "Improved Constant Humidity Room," to which was added the subheading, "Can be built and equipped for approximately $1,000." The same title and almost the same subheading could be used today for this article written in response to several requests for up-to-date information. As a result of the experience of having built nearly a dozen such rooms in accordance with the same principles, the design has been simplified. However, with the much higher current prices, the cost of equipping the room will now be nearly $1,000, so that to this, the cost of the structure itself will have to be added.

In most commercially installed constant humidity rooms, arrangements are made to circulate a portion of the air in the room through a spray chamber to cool and saturate it to the dew point temperature (53 Fahr. in the case of 50 per cent R.H. 73 Fahr. room) and then warm the air to the desired room temperature of 73 Fahr. As the air (saturated at 53 Fahr.) is warmed to 73 Fahr., the relative humidity drops from 100 to the required 50 per cent. The control of this process is usually by wet and dry bulb thermometers, the dry bulb thermostat controlling the final temperature to which the circulating air is heated; the wet bulb thermostat (at 61 Fahr., under these conditions) inversely controls the temperature of the spray water. The author does not favor the use of such a system, except for conditioning a very large room or building, mainly on the grounds of (1) the continual nuisance of having to keep the wet bulb thermometer in good condition, (2) the initial expense of the system, (3) the power required to operate it and (4) the fact that the controls, of necessity, are not very sensitive because a change of only ½ deg. Fahr. in the wet bulb temperature will change the final relative humidity of about 2 per cent.

These objections are all met with the principle of the system to be described. The wet bulb thermostat is replaced with a hair hygrostat, which, when calibrated, retains its calibration in a constant humidity room for an indefinite period. The sensitivity of the hair-operated hygrostat is such that a tolerance of plus or minus ½ per cent relative humidity can be maintained with ease. The initial and operating expenses of a room built in accordance with this design are much lower because of no ductwork and smaller fans. Moreover, by using neutral positions in both the temperature and humidity controls, all the equipment, except the air circulating fan, stops running as soon as the desired atmospheric conditions have been reached.

The plan and sections of a 12 ft. x 8 ft. x 7 ft. 9 in. room are shown in Figures 1, 2, and 3. The same layout has been employed successfully for a room 18 ft. x 16 ft. x 8 ft., but with a 50 per cent larger cooling unit. Circulating fan D, situated near the ceiling, sucks air up the triangular wooden duct E from beneath the bench and through the grills A, B, and C. One 12-inch or 14-inch desk type fan D or preferably a 12-inch wall type ventilating fan is enough to insure good circulation in the room of the size shown. However, in addition, if it is also desired to dry and condition pulp test sheets, another similar circulating fan but without a duct can be employed at a convenient location, arranged to draw room air through the drying rings commonly used for that purpose. It is preferable to employ the modern silent blade type of fan for D, also if a desk-type fan is employed, to enhance its performance by shrouding the blades in a metal cylinder fixed to the triangular duct.

If the atmospheric conditions in the room are correct, then the air continues to circulate from the grills A, B and C, along under the benches and up the duct E to the fan D again. If the temperature of the air in the room rises above that desired, thermostat J closes. This actuates relay L and starts blower F blowing air from grill C through the cold coil which is housed in a cork insulated box as shown. The cold air from this box joins the air going up duct E to the circulating fan D. If the air in the room becomes

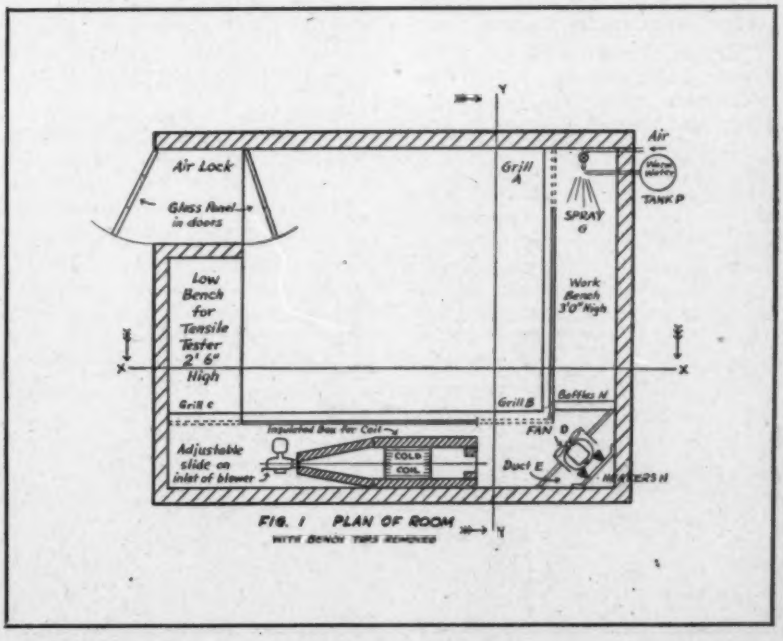


FIG. 1 PLAN OF ROOM WITH BENCH TOPS REMOVED

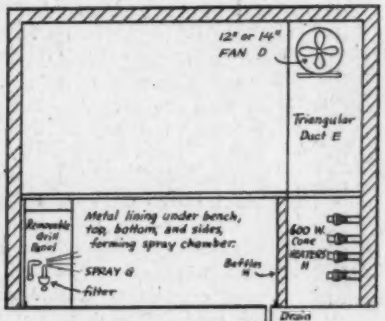


FIG. 2 SECTION YY OF ROOM

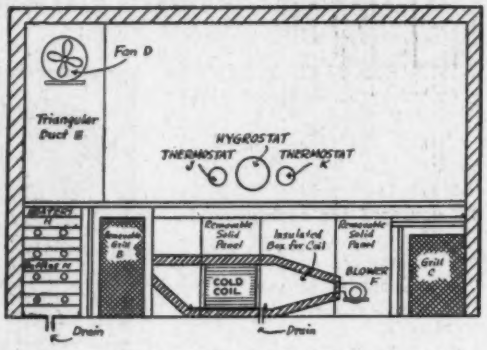


FIG. 3 SECTION XX OF ROOM

too moist, the hygrostat closes the same relay L and again the air is blown over the cold coil. The coil is maintained at a very low temperature (the maximum temperature is just above freezing on the defrosting cycle) by the normal control apparatus on the refrigerant compressor, so that air blown through the cold coil is dried as well as cooled. If the air in the room becomes too cold, thermostat K closes and through a relay starts the heaters H located beneath the duct. If the air in the room gets too dry, the hygrostat closes its other contact. This opens the air valve to spray G, which emits a fine spray of water warmed to about 80 Fahr. (to allow for cooling on evaporation). Part of the room air is being drawn continuously through grill A, the spray chamber, and baffles N, so when spray G starts, this air is moistened and joins the main air stream in the triangular duct E.

The operation of the room is so extremely simple that supervision of its equipment and functioning can be delegated to any laboratory technician.

Some Construction and Equipment Suggestions

The walls of the room need not be insulated if it is located inside a building or laboratory unless the air in the larger building is subject to extreme temperature fluctuations. However, an inch thickness of corkboard or other insulating board on the inside walls, or the provision of an insulating blanket between the joists in the ceiling and walls is desirable. In any case, the walls and ceiling should be airtight and, unless the inside wall is plastered, a layer of asphalted paper near the inside surfaces is desirable. Two doors forming an air lock are shown, which is the preferred construction if there is much traffic. Otherwise, a single door will prove to be satisfactory. A ¼-inch space under each door is enough to provide ventilation. The woodwork in the room should be given a good coat of waterproof paint or varnish to reduce surface absorption of moisture.

For a room of the size shown (about 800 cubic feet), a cooling coil with an area of about 36 square feet of total cooling surface will be enough, together with a ½-hp. compressor and a 250 cfm (⅜ in. head water) blower fan (American Blower Co. No. 125 ⅛ hp. 1140 rpm is suitable). A room with twice this volume would require the coil, compressor, and fan to be half again as large. The housing for the cold coil should be well insulated with one-inch thickness of cork or the equivalent. It will be noticed that the outlet of the box is near the top; this prevents the cold air in the box from flowing into the room when the blower is not running. A pan and drain are under the cold coil, the compressor being set so that the coil defrosts automatically on each cycle. The ½-hp. water-cooled compressor (commonly used for large iceboxes or freezers) is located outside the room and comes equipped, as is standard, with its own temperature control. The compressor, coil, blower, and housing may be obtained as a complete unit from L. C. Kohlman, Inc., Refrigeration Engineers, 112-116 North Green St., Chicago.

The spray chamber and spray shown in the figures is homemade. The inside of the bench above it is lined with metal to form the chamber, the floor being covered by a water-tight pan with drain to carry away the excess water. Alternatively, the spray chamber may be made in the form of a 20-in. diameter circular metal duct sloped upwards and provided with a drain at its lower end where the spray is situated. The spray, operating from 20 psi. or more air-pressure, is conveniently made from a paint spray gun (De Vilbiss No. G. F.

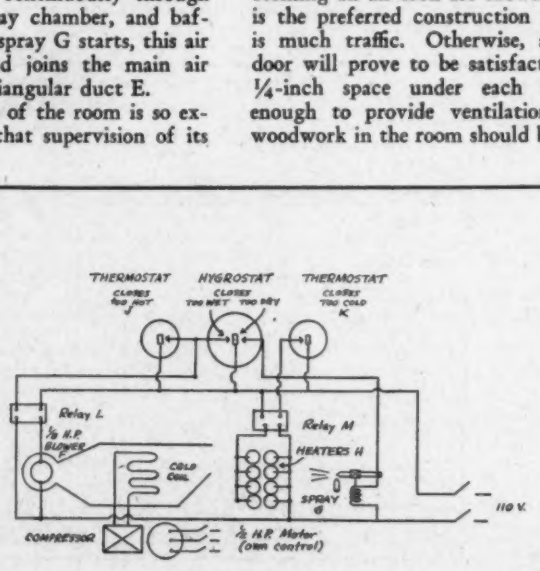


FIG. 4 WIRING DIAGRAM

Figure 5

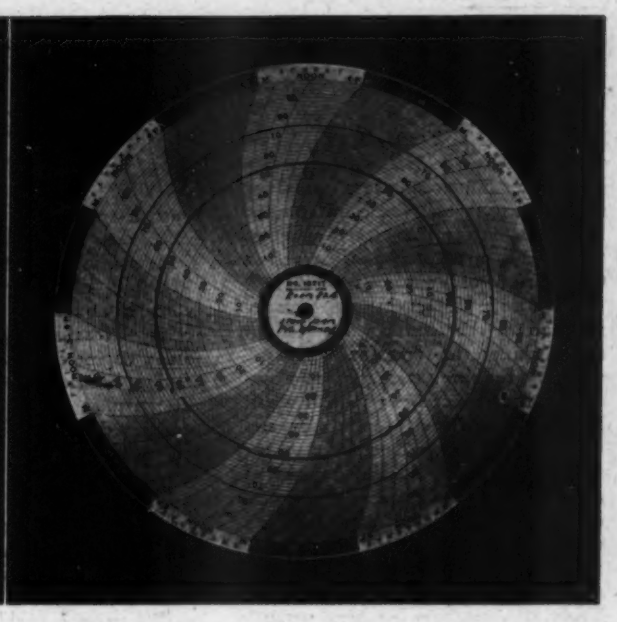


Figure 6

501) which has a self-contained air valve. The gun is suitably mounted with an arrangement for depressing the air valve by means of any small 110 V. solenoid. Alternatively, a small paint spray gun compressor unit, without an air reservoir, may be used, the hygrostat starting the compressor motor and thus the water spray, whenever moisture is required. The water jet in the gun is reamed out to about 1/16-inch diameter and the water is supplied through an ordinary gasoline-line filter and sedimentation bowl. In order to effect the moistening of the air to the desired degree, the temperature of this spray water has to be well above the dew point, preferably as warm as 80 Fahr. This is conveniently done by placing a small insulated water-supply tank P outside the room. The tank is equipped with a constant level float (ordinary lavoratory type) an immersion heater (250 watt Central Scientific Instrument Co. Cat. No. 165503) and a thermostat K (Cenco Cat. No. 99010C).

While experience has indicated that the spray gun type of humidifier is probably the preferred design, an enclosed spray chamber has been used quite successfully. Such a chamber (about 4 ft. x 1 ft. 6 in. x 2 ft. deep) is equipped with two 1/16-inch Buffalo nozzles which spray continuously and is provided with suitable baffles to prevent the spray reaching the blower or the room. At the end of the chamber near grill A is a 250 cu. ft. per minute blower similar to the blower in the cold box. When the hygrostat closes, this blower circulates air through the spray chamber, the air issuing from two 3-inch diameter holes on the upper side of the end of the chamber near the duct E. This enclosed type of spray chamber may be obtained as a unit from the Albert Pick Company, 2159 West Pershing Road, Chicago, Ill. In cold weather, for this design, it is usually necessary to use a temperature regulator for the water supply, adding hot water to keep the spray water between 70 and 80 Fahr. A mixing valve made by Preferred Utilities Mfg. Corp., 1860 Broadway, New York, New York, Type B-10 Thermostatic valve, $\frac{1}{2}$ inch or smaller, is suitable for this purpose.

The heater H, 600-1000 watts capacity, may be either a strip heater or be made up with a bank of 600 watt, 110 volt ordinary conical heaters with screw sockets, arranged as a bank of four pairs of cones in parallel, each pair being in series to reduce their temperature to that corresponding to 55 volts so as to avoid danger of fire. Even so, woodwork near the heaters should be protected from the heat with asbestos millboard.

A suitable hygrostat is made by the Brown Instrument Co. (No. 6881-820-1 with neutral point, or 6881-820-2). One week charts are recommended. It is also desirable to have this recording controller equipped with a temperature pen. A satisfactory thermostat K and relay for the heaters is obtainable from the Central Scientific Instrument Co. (No. 99500 Cenco Relay Unit) and for the thermostat J, Minneapolis Honeywell Type 42A1X2 is suggested.

Figure 5 shows a week's chart taken recently from the hygrostat controller in the large constant humidity room at the Quartermaster Food and Container Institute for the Armed Forces in Chicago, and Figure 6, a wet and dry bulb thermometer record taken from the same room. It may be added that the excellent operation shown by these charts is to be expected consistently if ordinary care is taken of the equipment.

Notes and Observations on BEATERS

B. M. BAXTER
Consulting Engineer

▶▶▶ DURING THE NEARLY two centuries since the Hollander or beating engine displaced stamp mills for reducing rag stock to pulp suitable for formation into paper, this piece of paper mill machinery has served a wide variety of needs.

In addition to serving its primary function of shortcoming fiber length and making the frazzled "fibrage" necessary for sheet strength and slowness, it has reduced rag to half stuff, broken and reduced pulp in dry and wet sheet form, and reduced paper stock and broke. It also has served as a washer for eliminating chemical liquors, chemical residues and ink solids; and has functioned as a bleacher and as a mixer for blending various stocks, sizing, fillers, colors, and alum. Truly, the machine has been versatile in its applications.

The charge has often been made that the beating engine, or as it has been and is more conveniently and generally called the beater, is a crude and inefficient device. This charge may be true. Certainly, much inventive thought has been applied to the development of a superior machine to supplant it. To some degree, these efforts have been successful—such as in the complete elimination of beaters in the manufacture of newsprint, and in the manufacture of kraft from Southern pine. Now there are some indications of elimination of the beater in the making of paperboard.

Devices designed to supplant the beater have taken various mechanical forms. Notably among them are the jordan engine or jordan, various forms of disc brushers, the combination of tapered plug and disc of the Marshall refiner, edge runners or kollergangs, rod mills, and other designs of more recent developments.

Such devices have been more or less successful in displacing the beater with respect to some one or few of its adaptabilities within limited fields of application. In their special and more or less narrow fields of application, these devices have shown superiority. None of these devices, to date, however, have challenged the beater over its broad field of use in papermaking.

Of the many uses and applications of the beater, this treatise is mostly concerned with its use for the reduction of fiber length, for the impartation of slowness and the formation of frazzled fiber ends or fibrillae, or, in other words, true beating. Such other uses as for breaking, washing, mixing, etc., will receive only incidental consideration.

AUTHOR'S NOTE: In *A Practical Treatise on the Manufacture of Paper in All Its Branches*, published in 1873, the author, Carl Hoffman, states:

- **"The invention of the beating engine or Hollander has laid the foundation for the present development of the manufacture of paper, and though over one hundred years have passed away since its introduction, it is yet very imperfectly understood and constructed."**
- **For nearly 50 years after this remark by Hoffman, little change other than an increase in size, occurred in beater construction. This observation may be made by inspection of old beaters still in service. An exception, however, was the introduction of the Horne Patent Beater. This beater differs from the Hollander in having its roll at the end of the tub instead of midway.**
- **During later years, the importance and advantages of beater designs permitting circulation and beating at heavier densities have been recognized, and beaters have been built to secure these advantages.**
- **Considerable light has been shed on the theoretical side of beating by Dr. Sigmund Smith's excellent work *The Action of the Beater*. Most outstanding in this work is the theory of formation of fiber across the cutting edge of the flybar, the conditions governing this formation, and density and travel necessary for maximum beating effect.**
- **Nevertheless, Hoffman's statement as to imperfect understanding of the beater remains true to a considerable degree. The information contained in this small work, gleaned during a considerable number of years devoted to paper mill engineering and operation, is offered to add somewhat to general knowledge. The material is original, with the exception of references referred to in the text.**

Slowness and Hydration

Slowness and hydration are two terms which are used rather loosely in the industry. They may mean one thing to one papermaker, but perhaps something rather different to another.

The term slowness refers to the rate of drainage of water from the stuff. Water drains rather quickly from a free stock; less quickly from a slower stock.

Hydration indicates the faculty of cellulose to absorb water into its cellular structure and the tendency of cellulose by chemical or mechanical treatment to change from a fibrous condition to one of a gelatinous nature. Mechanically-caused hydration occurs in the beater along with the shortening and splitting of the fibers. In part, this hydration is due to the length of time of treatment. The fact has a definite bearing on the diversity of stuff produced under apparently identical operating conditions except for a variation in the physical dimensions of the beaters.

Hydration imparts slowness to stock entirely aside from any change of fiber length or frazzling of fibers. Unfortunately, freeness testing devices, depending upon rate of drainage for their indications, do not distinguish between slowness caused by hydration and slowness resulting from the closer matting of shorter and finer fibers.

Certain stocks take on hydration readily under treatment in the beater. Among these stocks are Manila rope, soda-cook straw pulp. Mitscherlich sulphite pulp, and the stock obtained by cooking and washing to de-ink certain grades of paper stock. Much less readily hydrated are ordinary quick-cook or Ritter-Kellner bleached sulphites and such sulphites unbleached (especially hemlock). Bleached soda pulp requires very long and drastic beating.

Beating Tackle for Slowness

The term tackle means the flybars of the beater roll and the bars of the bedplate upon which the roll is lowered to effect beating.

If a slowness due only to cutting of the fiber is wanted, the flybar edges must be sharp. Also, the flybars preferably should have narrow edges and the wood spacers between bedplate bars should be kept well undercut.

Hydration and the production of long, slow stuff is promoted by long

EDITOR'S NOTE: This is Part I of a series. Further installments will appear in succeeding issues of this magazine.

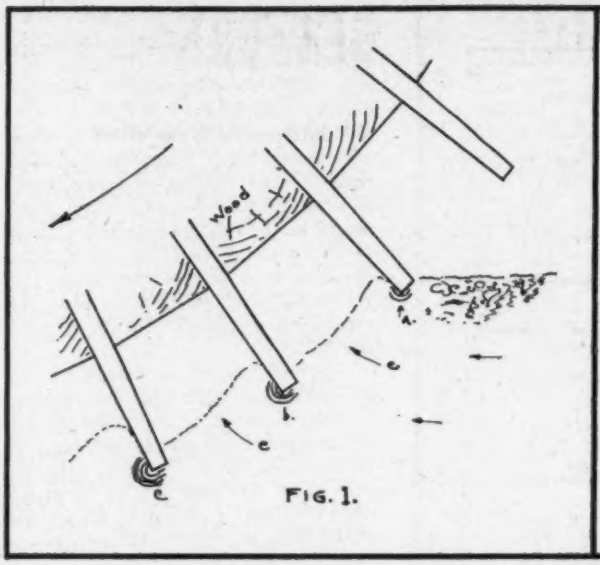


FIG. 1.

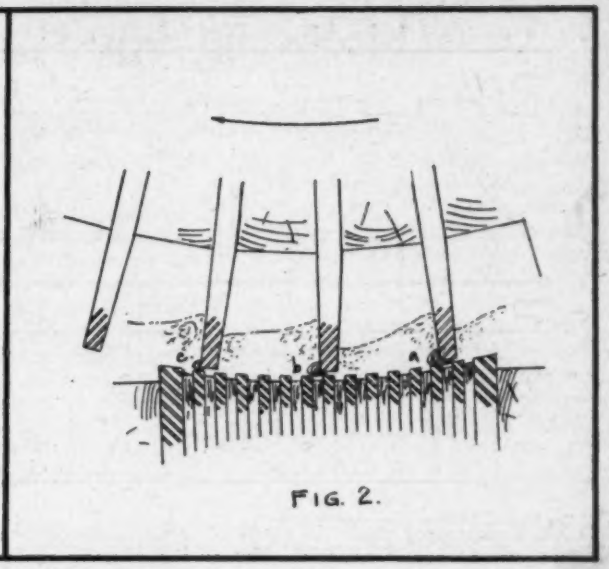


FIG. 2.

continued beating, with very light pressure of the roll on the bedplate, and with dull and wide edge flybars and smooth bedplates. The action is that of bruising and mashing rather than cutting.

If an extreme degree of hydration is wanted with a minimum of cutting, to produce a stuff approximating that made by rod mills and kollergangs, stone or lava rolls and bedplates are used in place of the usual steel or bronze tackle.

Slowness and Beating Density

Beating thin stock (stock at low density) produces free stock. Slow stock will result if the same stock is beaten at higher density with the same beater and tackle.

Slowness and Beating Temperature

Temperature of the stock in the course of beating has a marked influence on hydration. Warm or hot stock tends to remain free, and such slowness as it takes on is due to shortening of the fiber rather than to hydration. If a long and slow stock is wanted, the stock being treated must be kept cold during the beating. Warm water, even only moderately warm, used for beater furnish makes the production of such papers as Manila rope flour sacks, twisting tissue, the best grades of embossing and creping tissues and better grade rag bonds, ledgers and manifold difficult or impossible. For such papers, a supply of well water of constant temperature throughout the year is almost, if not actually, an absolute necessity. Such variations of temperature as occur throughout the year in water obtained from lakes and streams are troublesome. Under no circumstances should water be used which has been used earlier for cooling purposes in the condensers of steam power plants.

Theory of Fibrage Formation on Flybar Edge

Here, in brief, is the theory of formation of fiber masses or fibrage on the cutting edge of the flybar as developed and published by Dr. Sigurd Smith in his treatise, *The Action of the Beater.*

Figure 1 represents a portion of a beater roll, revolving in the direction indicated, just as the flybars are making contact with the stock coming to the roll. As the edge of a bar enters the stock, some fibers are caught and held against the cutting edge of the bar as at "a." This accumulation becomes thicker as the bar progresses farther into the stock as indicated at "b" and "c." The increased thickness of the mass results from the movement of the stock into the spaces between the bars as indicated by arrows "e." The amount of filling of the roll pockets by the flow of stock in direction "e" is a matter of the speed of circulation or travel of the beater.

The thickness of the fibrage on the cutting edge depends upon the average length of individual fibers, the thickness or density or consistency (all meaning the same) of the stock, and upon the rate of travel. The longer the fibers, the more fibrage will be draped across the bar edge to be carried along by the bar to the bedplate. Also, there will be more fibers in a given volume of stock approaching the roll when the stock is thick than when it is thin. Then, too, when the stock is thick, the fibers have greater ability to entangle themselves one with another.

The moving of a wire, a knife edge, or thin bar of metal edgewise up through a body of stock will demonstrate that the amount of stock caught and held increases very rapidly as the density of the stock is greater. In regard to the influence of rate of travel on fibrage formation, it is self-evident that roll bars cannot pick up stock unless the stock comes to the roll.

It should not be assumed that a progressive increase of speed of travel results in proportionally increased fibrage. On the contrary, there is a point beyond which increased travel

TABLE 1—Holland Beaters—Roll Sizes and Capacities

Roll Diameter (Inches)	Roll Face (Inches)	Nominal Capacity, Pounds, Dry Stock	Pounds Capacity Per Inch of Roll Face
36	36	500	13.9
40	36	600	16.7
44	44	800	18.2
48	48	1000	20.8
54	48	1200	25.0
62	54	1500	27.8
60	60	1800	30.0

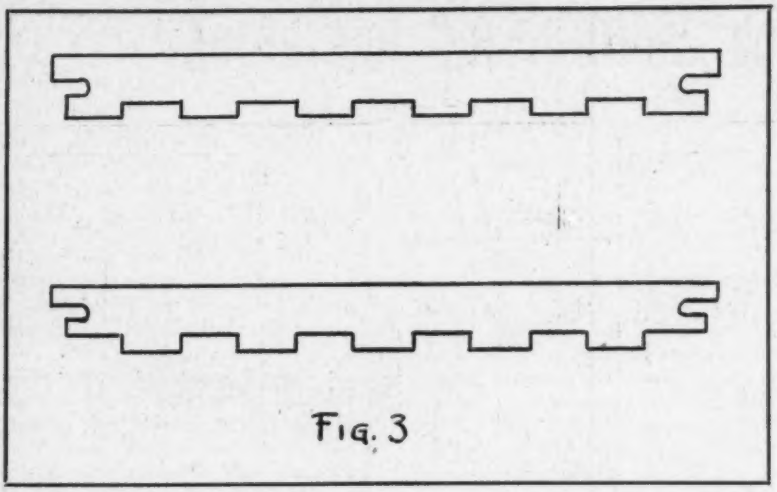


FIG. 3

or circulation speed results in no increase of fibrage formation. This point is reached when the bar edges will no longer pick up more fiber, the point being determined by the average length of fiber, stock density and by other conditions such as the sharpness of the edge of the bar. In this instance, it is plain that fibers will cling less readily to a rounded edge than to a sharp, square corner. Another condition is the ability of air to escape from the pockets as the stock moves in. A third condition is the distance between the bars; and yet another, the distance from the bar edge in to the wood.

The last mentioned condition is well known. Everyone concerned with performance of beaters has observed that, as the bars wear down, the rate of travel of the beater decreases. If the wear is allowed to progress far enough, travel almost stops. This condition may develop when the bar edge is still at a considerable distance out from the wood, possibly as much as two inches. Why the travel slows down in this manner is not clear since the pockets between the bars are never completely filled. In fact, maximum beating effect is obtained when the pockets are filled only to a small part of the total pocket volume. Possibly the condition results from an incomplete escape of air.

Fibrage Formation and the Bed Plate

Figure 2 illustrates a portion of a roll in contact with a bedplate of a common type. The fibrage formation on the bar edges is indicated at "a," "b" and "c." As a bar passes over the bedplate, the fiber carried on its cutting edge is cut if the bar is sharp, the plate bars sharp and the roll in close contact with the plate. If the clearance between bar and plate is greater, the fibers are drawn off the bar edge by the plate bars. If the flybar edge is rounded and the roll is down on the plate, the fibers are bruised, mashed, and abraded.

Fibrage accumulation on the flybar edge becomes less as the roll bar moves across the bedplate. The stock held in the roll pockets does not act to maintain it.

The bedplate is not effective in causing beating action across its full face width unless, possibly, the plate is very narrow, narrower than found in general practice. Many attempts, some of them within the author's experience, have been made to increase beating action by widening the bedplate. These attempts generally have been fruitless.

As a case in point, a close study was made over a considerable period of time of the action of a battery of five beaters. These beaters were alike in tub dimensions, roll diameters, and roll faces. All beaters served one machine, all beaters were supplied with the same furnish at the same density, and all furnishes were beaten to the same freeness test. The bedplates of these beaters, however, differed greatly in width, thickness of plate bars, spacing of bars and number of bars. In four of the beaters, the plates were in the usual position—directly under

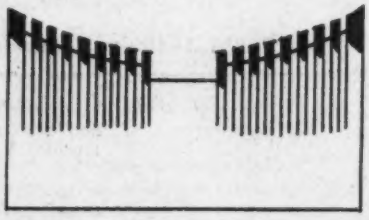


FIG. 4.

the rolls. In the fifth beater, the bedplate was located well upon the circle of the backfall face. All rolls, except one, were essentially alike in number and thickness of flybars. The roll different from the rest was filled with special bars. These bars had portions of their cutting edges cut back as illustrated by Figure 3; and were placed in the roll in staggered relation so that cutting edges of a bar came opposite gaps in the preceding and following bars. With such bars, the total cutting edge length was reduced one-half.

The beaters were compared by using the method of inch cuts per minute. The number of inch cuts per minute is obtained by multiplying the face of a roll in inches by the number of roll bars; this product, in turn, by the number of bedplate bars; and finally that product by the revolutions per minute of the roll.

In the five beaters which were studied, the inch cuts per minute figure differed to the extent of about three to one, the lowest figure being for the roll having the staggered edge bars.

The outstanding observation that came out of the investigation was that the results revealed no practical difference in the five beaters, the differences in beating time being no more than would be accountable by differences in distance from roll woods to cutting edges of flybars, some bars having been worn down more than others. Of the four beaters with conventional bars but differing greatly in plate construction, there was no appreciable difference.

Had there been some means to distinguish between slowness due to fiber shortening and slowness due to hydration, some differences might have been found. It is reasonable to infer that such differences existed, but if they did exist, they were not such as to be noticeable in machine operation and sheet tests.

These beaters were of the so-called "high speed" type—converted old beaters with tubs and backfalls altered. They were furnished to about eight per cent density with slushed bleached sulphite stock, washed down to a definite density. Several rolls of soda pulp were added to this stock shortly before dumping and after it had been beaten to a freeness standard.

Attempts have been made to reestablish the fibrage on the cutting edges of the flybars by constructing bedplates with the bars in two groups, allowing a considerable space between the groups as in Figure 4. Results of these efforts have not been striking, possibly because the elapsed time in

the passing of a bar over the space is too short to allow fibrage to form. Further, it would seem necessary that the stock move inward into the pocket. There is no provision for such motion.

Beaters have been built with two bedplates spaced at some distance apart. In some instances, one plate may be directly under the roll; the second plate about 45 degrees up on the face of the backfall. The purpose behind such a design is to increase the beating action of a standard beater possibly by as much as doubling it. Such beaters have not come within the experience of the author.

Two-bedplate beaters, having a space between the bedplates fitted with a reciprocating device to move the stock into the bar pockets thus causing fibrage to form on the bars ahead of the second bedplate, also have been proposed. A design of this kind probably would be fraught with mechanical and maintenance difficulties.

Holland Beaters-Roll Dimensions and Capacities*

The term Holland beater indicates the common, ordinary type of beater which is still very generally used, especially in older mills. The tub has parallel sides and semicircular ends. The roll is located midway between the ends. The dividing partition—the midfeather—is midway between sides or nearly so, frequently being about two inches off the center line of the tub away from the roll side.

Such beaters have been commonly made with both wood and cast iron tubs.

Floors have been usually of wood in wood tub beaters; sometimes of wood, in cast iron tubs. Frequently, however, cast iron and in later years, concrete, has been used for the floors of cast iron tub beaters. Floors of wood and cast iron are commonly flat and with little or no pitch. The crest of the backfall is commonly at the level of the center line of the roll. The height of the tub at the front end is usually three to five inches less than the height of the center of the roll. The rear end is three to five inches higher than roll center. The variation depends upon the length of tub.

Roll dimensions and capacities of commonly used sizes of Holland beaters are given in Table 1.

These capacities are based on stock densities of about five per cent. The actual holding capacity varies somewhat with various stocks. It also varies with the rate of travel wanted. The travel is fairly rapid at about four per cent density, rather slow at five per cent, and very slow at six per cent. Six per cent density is about the limit with any stock and is unattainable with some.

The length of tub varies from about 18 ft. for beaters with a 36-inch roll face to about 26 ft. for 60-inch rolls, usually increasing by two feet for six inches increase in roll diameter. The roll is supported about seven inches above floor level to permit pulling out the bedplate over the floor, making height from floor level to center of roll about 25 inches for 36-inch diameter rolls and about 37 inches for 60-inch rolls.

Many beaters conforming to this general description may still be found in service bearing date markings from about 1880, or even earlier, to about 1915. (These dates should not be taken as exact but rather as indicative.)

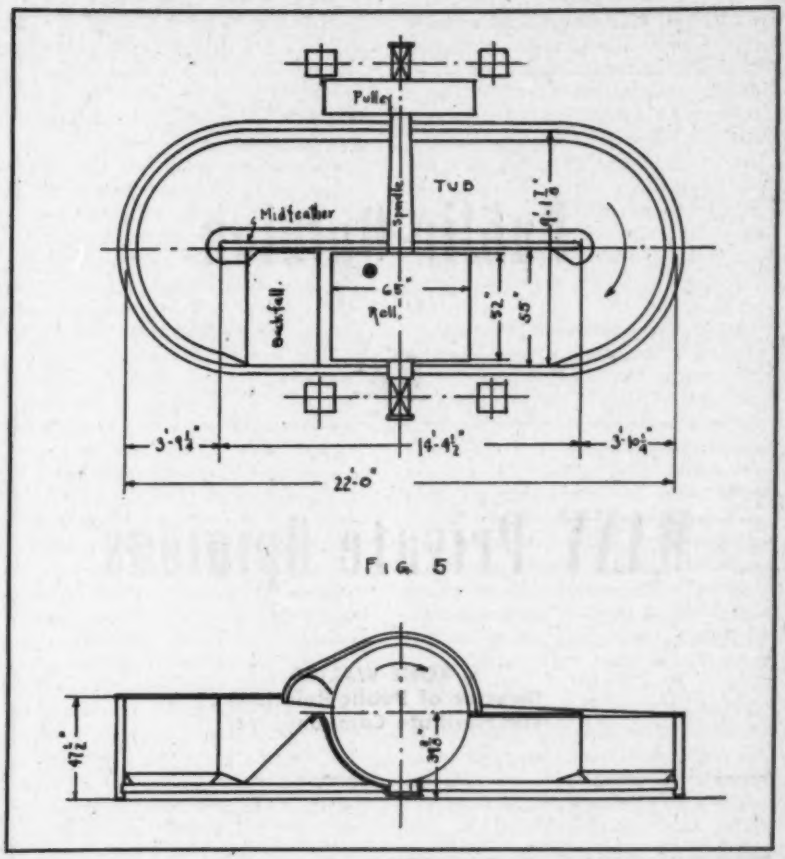


FIG. 5

Builders of Holland Beaters

The principal builders† of beaters during the period just mentioned were:

Dayton Globe Iron Works, Dilts Machine Works, Downingtown Manufacturing Company, Emerson Manufacturing Company, J. H. Horne & Sons Company, E. D. Jones & Sons, Noble & Wood Machine Company, Stout, Mills & Temple, and Valley Iron Works Company.

Beaters made by Dillon and also by Muldoon occasionally were found. Towards the end of the period, Dayton Beater & Hoist Company became prominent.

Until about 1915, beaters of various makes differed mainly in details of construction. The general design was rather definitely standardized with the exception of a Dilts design of iron tub beater introduced about 1912.

This Dilts design used a tub that was considerably higher at the rear end. It also employed a concrete bottom or floor which had a very considerable pitch or fall from the rear of the backfall around to the front of the tub, thus giving much increased travel. This beater, built mainly with rolls of 62-inch diameter by 54-inch face found much favor in paperboard mills.

In general, Figure 5 shows the final development of the flat-floor Holland beater. It is reproduced from the drawing of a manufacturer and covers a design of beater built in 1916.

(*) Since this work is confined almost entirely to personal observations of the author, references are omitted to beaters of special types such as the "over and under" Umpherston, the Miller Duplex, the English Taylor, the Marx, and other special forms and forced circulation types.

(†) The names given are those of builders whose product has at various times come under the author's observation. The list is not given as being complete and including all builders.

Public Opinion

Is

MANY Private Opinions*

L. ROHE WALTER
Director of Public Relations
The Flintkote Company, Inc.

▶▶▶ DAILY, ON EVERY HAND, the clear-thinking citizen can observe American business at work. So familiar are its accomplishments, they are accepted as commonplace; hence, not much thought is given to the relationships between the vitality of the business process and the general well-being of the country. On the other hand, because of the general misunderstanding that has arisen between the desks of management and the workbenches of the country, the purpose and utility of business are regarded with suspicion and distrust so that, more than anything else today, this nation needs industrial harmony.

How long can we afford strikes that cost the United States 85 million mandays of direct lost time in the first half of 1946, a total more than nine times the semiannual average for the prewar years 1935-1939, and 15 times the first-half average of the war years 1944-1945? In terms of dollars, this direct loss is at the rate of 4⅓ billions of dollars for this six-month period, based on a Senate Committee estimate of $51 a man-day for the total economic loss experienced in strikes during the first half of 1946.

What is behind this disquieting attitude toward industry in a land famed for its supremacy in the production of goods which produce the best life in recorded history? Why do so many Americans hold so firmly to erroneous conclusions about business, particularly those relating to profits and how they should be shared, so that they cannot act intelligently and realistically even in their own interest?

Why do some industrialists still cling to a naive belief their workers automatically owe and should extend their employer unquestioned loyalty in all matters? Why are they hurt and bewildered when employees don't seem to appreciate that their well-being is dependent upon company prosperity? Why do some of these business leaders consider fancy washrooms and sending flowers to an employee's sick wife adequate gestures that take the place of an over-all intelligent attempt to sell—and keep selling—all ranks from junior executives down—on the mutual stake they all have in the company's success and in the sound functioning of free enterprise?

Why does management willingly spend large sums of money for product, advertising copy, radio and market research, and devote so little time and money to find out what appeals to its people, what they are confused about, and where they are misinformed?

Why is it that the really only dangerous weakness of the best economic system so far developed is the system's inability to explain itself? Why are we suddenly realizing that we must "cultivate the science of human relationships" if we are to make the free enterprise system tick?

Fundamental to an understanding of the problem is the fact that business in the United States, partly through its own fault and despite its outstanding, almost miraculous record of war production, has been and still is in the doghouse. Because of the greed or corrupt practices of a small percentage of businessmen; because a relatively few corporation executives operate their companies for their personal benefit rather than in the interest of stockholders, employees and the public; because a relatively few corrupt promoters and contractors waxed fat on unconscionable and excessive war profits, notably in the mushroom munitions manipulation, all business management has been and is being criticized and condemned.

It is a well-known fact that business, so capable and ingenious in improving and selling its products and services, has been behind public opinion when it should have been ahead. It has been frightened into the notion that it must move through subterfuge, in secrecy, and with doubt as to its approach, so that all too frequently it speaks apologetically of efforts to develop good relations with the public. It is, for example, currently failing to give the public a clear explanation of the factors behind present price increases, and unless it does so, it will take the blame for higher living costs which are beyond its control. Business seems to have been thrown into confusion, not because of any inherent or irremediable weakness within itself, but because it has failed to make clear to the people the philosophy and principles of its existence.

Today's situation, with organized antagonistic groups and pressure blocks attacking the utility of business, is by no means unique. It is a recurring phenomenon of American life that at varying intervals an administration or public leader launches an attack on certain sectors of business activity or on business generally. This was true in Andrew Jackson's time; it characterized Cleveland's administration; it happened again in the days of Theodore Roosevelt and his "big stick."

More recent years have witnessed the re-emergence of similar activities in more vigorous fashion than ever be-

(*) An address given before the 15th annual meeting of the Controllers Intitute, at the Hotel Commodore, New York City, September 17, 1946.

fore. Currently, Washington has been and still is extremely active in propagandizing economics. The financial facts of life, once delineated only on the financial pages of the newspapers and in specific periodicals, are currently headline news. Unfortunately, much of this flow of economic news is keyed to political economics, charged with ideological aims, cloaked with concealed purposes and projected to the public against a scare psychology background, heightened by the fear motif.

Obviously, large sectors of the American public do not regard these actions as attacks; from their point of view these efforts represent proper remedial actions which cause business to clean house and give the public a square deal.

Now no responsible leader of this country's business will maintain that all business activities or institutions are perfect, proper and lily-white or that some activities and certain parts of American business cannot properly undergo a housecleaning. In every group there are good men and evil men, wise men and fools, the just and the unjust, the greedy and the generous. Human nature and human institutions continue under all systems to have their endless variety.

However, the essential problem of government is to police men's activities so that wrong may not be done and justice prevail. Instead of seeking to reduce and prevent injustice between citizens, many politicians, pseudo economists and radicals blindly attack a system of production and distribution that by its results, as reflected in our standard of living, is the best so far devised.

Unfortunately, the thoroughly essential and justifiable inquiry into the disclosure of isolated instances of wrong doing, both in peacetime and wartime operations, is frequently made the basis for general and even universal suspicion and censure. As heartily as the objective-minded citizen subscribes to the former, with equal earnestness he should deplore the latter and insist that any operation, well and fairly conducted, be vigorously defended from unjust aspersions, whether intentionally or inadvertently directed against it. In the final analysis, American business should be in a position to refute any malicious or calculated propaganda, even remedy its ill effects, so that the policies and purposes of business may be properly interpreted and, where justified, understood to be right and proper in the eyes of society.

Falsehood and misrepresentation can only be successfully combated by plain, unvarnished truth, which in the long run always wins. The nation's business cannot afford to let "the mills of the gods grind slowly" for, truly, they grind too slowly to be helpful in the present circumstance. Business cannot proceed too leisurely in making friends, lest the opposing forces completely undermine public confidence in the integrity and usefulness of American business.

Today, perhaps more than at any other time in history, business should raise its sights and present its fundamental case by intelligent, constructive planning in the field of public relations. It must tell its story and win friends as regards "The right further to serve and grow and achieve—the proper relationship with government and government with business—a clear understanding by the people of the functions of business so that business can do more for the people—provide a higher standard of living—better wages—a richer and fuller life."

American business must broaden its views. Business leaders must realize that not every strike is due entirely to the machinations of a labor agitator, or a consumers' boycott to the initiative of a wild-eyed reformer. Many of these costly industrial blunders are caused by the stubborn insistence of a corporation executive who would rather fight than settle and who believes favorable public opinion can be immediately created for his side of the proposition by using full-page advertisements expounding his point of view.

Corporation executives could learn much in the handling of public relations from the Chinese who pay the doctor in advance to keep the individual healthy rather than call him in only when the patient is seriously ill or dying. Some far-sighted business leaders do use this "Chinese doctor" policy. They view good public relations as an important day-by-day activity. They build up an acceptance, over the years, of a justification for their company's existence; they are consciously alert to interpret their business in terms of human usefulness. In time, the institutions headed by these executives take on a character and a personality that make them appear warm, human, and socially useful in contrast to the ogre-like, cold conceptions of concerns which overlook this highly important duty to themselves, their stockholders, their employees, and the public.

Actually, public relations is based on "relations with people" and any business, large or small, has relations with people. In these days of anticipated increased competition and currently confused labor-management problems, the right kind of relationships with old, new, or prospective customers, employees, stockholders, local, state and federal governmental legislative bodies and bureaus, and the general public are not only highly desirable as a form of business insurance but commercially profitable as well. "Next to doing the right thing, the most important thing is to let the public know you are doing the right thing." A sound public relations program recognizes the basic wisdom of this saying.

American business, whether large or small, cannot afford to ignore public sentiment. No less an astute judge of human nature than Abraham Lincoln said, "Public sentiment is everything. With public sentiment nothing can fail. Without it, nothing can succeed. Consequently, he who molds public sentiment goes deeper than he who enacts statutes or pronounces decisions—he makes statutes and decisions possible or impossible to execute." That statement was true in 1860; it is true as gospel today; and it will be equally true for countless years to come.

Equally pertinent to this subject and too generally overlooked is the inherent logic of this statement by Jan Struther in *A Pocketful of Pebbles*: "Private opinion creates public opinion. Public opinion overflows eventually into national behavior and national behavior can make or mar the world. That is why private opinion, and private behavior, and private conversation are so terrifyingly important."

Accepting these observations, along with the realization that "It is not enough to give employees a square deal: They must be shown they are getting it," and that management-labor relations in common with all other human relations are always likely to be under some friction, we at The Flintkote Company are attempting to create favorable and sympathetic private and public opinion and understanding among the owners, management, employees, and those other groups of people closely associated with Flintkote to win industrial harmony, increase production and lower employee turnover. Our activities are, therefore, in simplest terms, directed to:

1) The approximately 6,000 employees of the company and the citizens of the communities in which our plants are located.

2) The approximately 11,000 owners of the company—the holders of its common and preferred stock—located in every state of the union and the District of Columbia.

3) Flintkote distributors, and all others involved in the distribution

chain, who handle our broad lines of building materials, products for industry, composition tile products and paperboard products.

4) The public who are actual or potential users of our products.

5) The governmental agencies, directly concerned with the activities of the construction industry, of which Flintkote is a part.

Let me explain our methods, techniques and, above all, our philosophy as it concerns the company's relationships with its employees and its stockholders.

In our experience, plant magazines published by and for the employees of the company provide an excellent medium directed to our approximately 6,000 employees in the major plant locations. Seven of these publications, issued monthly "by and for Flintkote employees," build an *esprit de corps* within plants and serve as a bridging link in humanizing both labor and management so that each may better understand the other's problems and viewpoint.

Other editorial objectives include the integration of departments within a plant, the development of pride in the company's products, policies, and progress and the furtherance of safety and health programs. Further, these magazines provide opportunities for recognition of individual or group employee accomplishments, encourage and report on employees' off-duty time devoted to civic affairs, and acquaint the folks at home with the breadwinner's employer.

Recent articles in Flintkote plant magazines, in addition to local news about employees (which ordinarily utilizes half or more of the pages) have included subjects such as:

Who Owns The Flintkote Company?

Customers Set the Prices

How Is The Flintkote Company Run?

The Free Enterprise System

Research—A Flintkote Business Insurance Policy

To Live Better We Must Produce More

Sound Planning and Teamwork at Flintkote

Currently, a brief history of Flintkote in five monthly installments is being favorably received.

May I emphasize that this program is not a campaign of propaganda to induce employees to act in the interest of management and owners, but objective education in its truest sense —without which employees cannot act intelligently and realistically even in their own interest.

Since we care what plant-community people think about The Flintkote Company, magazines are sent monthly to the civic leaders in each city where Flintkote plants are located, preceded by an explanatory personalized letter from the plant magazine editor. Thus the citizens of these communities, of which The Flintkote company is a part, receive correct, current information about the company, its employees, its activities, and its products.

A lot of us like to squeeze the last advertising penny's worth out of our publication advertising by merchandising various advertisements to trade outlets, to distributors, to salesmen. We send out reprints in booklet form, as envelope stuffers, as presentations and as plain reprints. In this zeal, some of us forget the good folks in our own backyard, in the plants that make the product.

We are, therefore, quite inexpensively merchandising our advertising to our plant employees by reproducing current advertisements on the back cover of our plant magazines, in space frequently wasted, and in a fashion that gives prestige and good appearance to these publications.

Our policy on the release of material to plant magazines is clear-cut, realistic, and workable. All articles prepared in my office or cleared through it are approved for release by our executive vice president, who has final executive responsibility for our public relations and industrial relations, after prior checking with the company officials who are most concerned. Then actual distribution to the plant magazine editors is made after review by the company's general personnel director, who is closely in touch with all plant personnel matters. All such material forwarded to the editors is for "suggested use" and the editors enjoy wide discretion in the make-up of their magazines, the primary function of the company's director of public relations being that of a co-ordinator. Policies and procedures as to the objectives, editorial balance (as between personals, sports, photographs, company stories, education, cartoons, editorials, and employee contributions), community relations, make-up, type and printing specifications, the creation, training and operation of departmental reportorial staffs, a copy guide, instructions on writing style and other pertinent matters involved in the issuance of an effective plant magazine have been summarized in bulletin form and placed in the hands of all editors. Particularly stressed is the fact that, while the plant magazine is part and parcel of journalism, its successful production is dependent upon common-sense rules that differ from the usual production of written words for sale. The reader must be entertained, instructed and informed with no expense to him and low expense for the producer. Consequently, a specialized publishing technique is utilized.

By way of summary we feel that magazines for employees, properly planned and produced, serve well as the basic medium in an organized program for keeping employees informed about the company and inevitably create a greater "my job" and "my company" spirit. Inherent to the success of such a venture is the integrity and sincerity of the editorial content —in fact, an outstanding characteristic of the employee magazine must be its sincerity. Any insincerity or the actual or implied semblance of insincerity, "soft soap" tactics or misleading approach, in a plant magazine, will be quickly detected and inevitably defeats the very purpose of the magazine's objectives.

Finally, let me emphasize that the heart of any industrial relations program isn't merely providing bats, balls and a softball diamond, tennis courts, golf courses, or clean cafeterias and wholesome, economical meals as the piece de resistance; neither is it beautifully done, one-shot propaganda posters or occasional special mailings.

These all help and play their part, but the real core of the solution is to be found in day-by-day selling, educating, informing employees so that they understand the economic facts of life, so that they understand why everyone benefits from mutual respect and company success. In doing so, we must realize that the average American-workingman is no different when he is on the job than when he is in the store as a buyer and that, at heart, he is a firm believer in the free enterprise system. One obvious answer to the problem is better internal merchandising, operating on the individual industry and community level.

All too frequently stockholders are overlooked in a corporation's promotional plan. Many companies that expect vitality and progressiveness in their sales promotional materials are content with a conventional outmoded annual statement. The purpose of the public relations campaigns to stockholders sponsored by the more progressive companies is to maintain an informative, periodic contact with the real owners of the business and to acquaint them with their company's manufacturing processes, market opportunities, policies, problems and products.

Incidentally, the National City Bank of New York, in its June (1946) letter, reported that stockholders outnumbered workers in 72 of the nation's 100 largest corporations. These

72 corporations had 4,082,805 stockholders in 1945, an increase of 17 per cent in the last 10 years, and 2,925,449 employees, the ratio being 1.4 shareholders to each employee. Total pay rolls averaged $2,880 per employee for the year. Dividends paid were less than 12 per cent of wages, and less than half of taxes. For every employee, on the average, there was a capital investment which amounted to $9,300.

The National City found similar relationships in eight large railroad and public-utility companies with a ratio of 1.2 shareholders to each employee. Wages and salaries last year were nine times as large as dividends.

Among individual companies, General Motors had 345,940 employees in 1945 and 425,657 shareholders. The Packard Motor Car Company, at one extreme, had 10.4 shareholders for every employee. The Douglas Aircraft Company, at the other extreme, had only one shareholder for every 3.08 employees. At Flintkote we have currently approximately 11,000 holders of the company's common and preferred stock and 6,000 employees, a ratio of 1.8 shareholders for every individual employee.

Here's what we are doing to utilize the power of these 11,000 stockholders in exerting a beneficial influence upon the affairs of the company they own.

Our Annual Report for 1945 is printed in two colors. Illustrated on the inside front cover, by means of spot illustrations, are the company's major lines of products.

On the foreword page the company's record for 1945 is highlighted together with its philosophy regarding free enterprise.

On page 2 of the Report we depict, by pictures and caption copy, the news about the company's research and plant expansion program, currently entailing an investment of $16 million.

Included in the report of the company president, on pages 4 and 5, are sizable pictorial charts explaining "Product Diversification Reflected in Sales for the Period 1936 to 1945" and "Distribution of Income—Paid Out in Dividends and Available for Operations and Growth" for the years 1940 to 1945.

On page 7, the reproductions of current advertising emphasizes our theme, "Flintkote Makes *Many* Things." All reproductions used are legible so that the interested reader may get the facts about the diversity of Flintkote products.

Tied in with and immediately following the customary fiscal data and auditor's report is a double spread (pages 14-15) devoted to historical fiscal data for a ten-year period, 1936 to 1945, and giving a "Comparative Condensed Consolidated Balance Sheet" and a "Comparative Condensed Statement of Consolidated Income."

On page 16 of the report, an illustrated map depicts the location of offices, factories, and warehouses strategically near the major market cities to assure efficient production and delivery service.

The caption copy reproduced on the map states in part: "Flintkote's diversification policy is graphically reflected by the product listings on the following pages. Your familiarity with and continued use and recommendation of these products will contribute to the success of your company."

The two facing gate-fold pages are used to list, under eight major groupings, the more than 100 kinds of Flintkote products made and distributed during 1945.

On the reverse fold the company's offices and operating subsidiaries are listed, so placed that they may be used for reference purposes with the illustrated map, while on the rear cover a large identifying trade-mark is reproduced together with the slogan, "Better products for American homes and industry."

This report seems to be in keeping with the modern trends as revealed by the prize-winning reports in the Financial World's Annual Competitions and has been awarded their "Highest Merit Award as among the most modern from the standpoint of content, typography and format of the 1,500 annual reports examined during 1946." Currently it is being considered for a Best of Industry Award along with those of nine other companies in its classification.

We believe that an informative, attractive, annual report is a must. We also believe that we should utilize other opportunities to keep stockholders informed about their company's progress. We do so, for example, in dividend notice folders which accompany every dividend payment. The last four of these used explain:

1) The acquisition of The Tile-Tex Company, asphalt tile manufacturers, and the announcement that plans are being formulated to expand the manufacturing and distribution of the products offered under the Tile-Tex name.

2) The completeness of our paper and paperboard products activities centered in the Los Angeles plant.

3) More recently we have emphasized the diversification of our lines of building materials and their utility in the current housing shortage. Included with this folder was a small replica of the Bureau of Ordnance Award Certificate given the company by the Navy Department for "outstanding performance in research and development of a suitable material for lining the cavities of thin-walled ammunition."

4) Our latest dividend notice folder, mailed early in September, 1946, tells our stockholders what is being done to humanize relationships between labor and management by means of the company's plant magazines.

In each of these dividend notice folders we list the major groupings of our company products as a reminder to the owners of the diversity of its activities.

These notices give us the opportunity to keep stockholders promptly informed on current developments throughout the year, rather than waiting until the year-end, when much of the news might lose its freshness and appeal.

I do not wish to give the impression that we feel that we have found the panacea for all our problems in the matters I have reviewed. Neither do I intend to leave with you the thought that this question may be as simple as I have purposely outlined in these remarks. My primary objective has been to give you an understanding of the philosophy and spirit that animates our program, some facts about its operation, and some insight into the techniques used.

Finally, let me refer back to Jan Struther's comment that public opinion is actually the composite of many private opinions. By directing our efforts toward the people most closely concerned with the company's welfare—its stockholders, its employees, its distributors and those portions of the public and governmental bodies most concerned with the use of its products—we are following what seems to us a sound premise: that public relations (what everybody in our company does to earn—or lose—the public's good will), like charity, begins at home since public opinion is actually the sum total of many private opinions.

Paper SKETCHES . . . . . .

CICERO, FAMED ORATOR OF ANCIENT ROME, SAW A COPY OF HOMER'S "ILLIAD" WRITTEN ON A PIECE OF PARCHMENT SO THIN AND FLEXIBLE THAT IT COULD BE ENCASED IN A NUT SHELL!

TO PROVIDE SUPERIOR PAPER FOR PRINTING THE DECLARATION OF INDEPENDENCE, THOMAS AMIES OF PHILADELPHIA, IN 1817, USED SPECIAL MOULDS AND FELTS, AND FINEST LINEN RAGS. MADE IN A SHEET SIZE OF 26" BY 36", AND TO A REAM WEIGHT OF 140 LB. THE COST OF THE PAPER PER REAM WAS $125.

ROLLS SERVED AT THE 24th ANNUAL SPRING LUNCHEON OF THE CHICAGO TRIBUNE FOR NEWSPAPER CELEBRITIES, WERE LEAVENED WITH YEAST MADE FROM THE SUGARS IN THE WASTE SULPHITE LIQUOR FROM THE ONTARIO PAPER COMPANY MILL (A CHICAGO TRIBUNE SUBSIDIARY) AT THOROLD, ONTARIO. THE YEAST WAS SUPPLIED BY A COMMERCIAL YEAST COMPANY, THE PLANT OF WHICH IS LOCATED ON THE PROPERTY OF THE PULP AND PAPER MILL. THE DATE OF THE LUNCHEON WAS APRIL 23, 1946; THE PLACE, WALDORF-ASTORIA, NEW YORK.

The PAPER BOUGHT IN 1538 BY GRAFTON TO PRINT HIS ENGLISH BIBLE IN FRANCE, WAS CONFISCATED BY CHURCH AUTHORITIES AND SOLD TO AN APOTHECARY AS WASTE PAPER FOR WRAPPING PURPOSES. THE APOTHECARY IN TURN SOLD IT BACK TO GRAFTON FOR THE BIBLE HE COMPLETED IN LONDON.

four of a kind

CONTROLLED PENETRATION
HIGH GLOSS
UNIFORM SURFACE
FULL BRILLIANCE

Kelgin, the modern algin surface sizing agent, deals a winning hand in the preparation of paper board for wax coating and gloss ink printing.

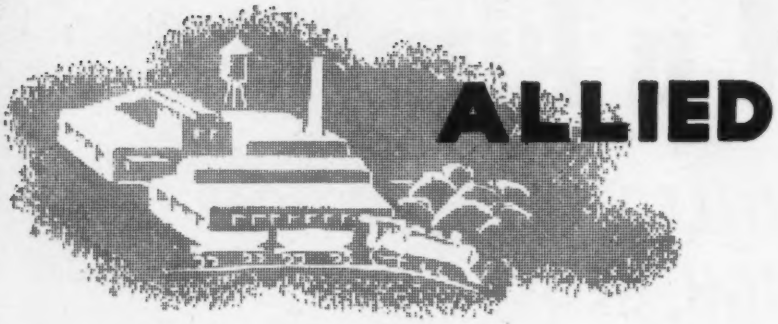
Kelgin insures a smooth, dense surface . . . increased gloss . . . clean color values. It is readily adaptable to water box application in the calender stacks. Kelgin is soluble in both hot and cold water . . . will not produce picking, foaming, sticking to the rolls.

Kelgin is a product of nature, free of impurities, rigidly processed to produce consistent, uniform results. Consult the Kelco technical department for full cooperation in your surface sizing problems.

KELCO COMPANY

20 N. Wacker Drive, CHICAGO-6 | 31 Nassau Street, NEW YORK-5 | 530 W. Sixth Street, LOS ANGELES-14

Cable Address: KELCOALGIN—New York



CARTER, RICE MERGED WITH BULKLEY, DUNTON AND CO.

The merger of Carter, Rice and Company with Bulkley, Dunton and Company, Incorporated, has been completed, according to a late announcement. The joining of the two companies will result in broadened service to the industry and extended territorial coverage in New England. The policies and principles of operation of neither company will be affected by the change.

Hubert L. Carter, former principal owner of Carter, Rice, has retired and has transferred his entire interest in the company to the consolidated organization. The new board of directors of Carter, Rice will be made up by C. A. Esty, who is also president of the company; W. H. Cowles, vice president; J. O. Bulkley, treasurer; and J. C. Marvin, executive vice president. Other officers of the organization are: D. A. McGreenery, assistant treasurer, and John H. Brewer, vice president.

◆

ASKANIA ACQUIRES CRAM PATENTS—DEVELOPS NEW CONSISTENCY REGULATOR

Purchase of the patents belonging to the Cram Company, Appleton, Wisconsin, by the Askania Regulator Company of Chicago, Illinois, has lead to the development of a new consistency regulator.

Combining the operating principles covered by the former Cram patents with its hydraulic control system, officials of the Askania company state that they have developed an extremely accurate and positive method for the control of thin stock consistency (as low as .1%) as required by the pulp and paper industry.

◆

"ROTAMETERS" TRADE NAME REPLACED BY FLOWRATORS

Fischer & Porter Company, Hatboro, Pennsylvania, announces a change in the trade name of its flow rate instruments.

Heretofore, these instruments have been called Rotameters. Due to the fact that this name originated about 40 years ago and because in the light of changing times it does not describe either the function of the instrument or any fundamental operating requirements, the company believes the new name *Flowrators* carries more significance—furthermore, it will not be the subject of controversial pronunciation.

◆

STALEY CO. ANNOUNCES $15,000,000 EXPANSION AND MODERNIZATION PLAN

A $15,000,000 modernization and expansion program has been announced by A. E. Staley Manufacturing Company, Decatur, Illinois.

President of the company, A. E. Staley, Jr., states that a substantial amount will be spent on modernization of the plant, including installation of the most efficient newly-developed corn processing machinery. The major expenditure, however, will be on the creation of additional processing capacity.

Retained earnings of the company will cover a substantial portion of the cost of the project, Mr. Staley said, adding that an undetermined amount of new capital financing is contemplated at a later date.

A. E. Staley, Jr.

Corn grind capacity of the plant will be increased from 50,000 to 75,000 bushels daily. The expanded corn refinery is one of the two major units of the Staley plant. Most of the increased capacity of the plant will be used in the manufacture of "Sweetose," an extra-sweet syrup made by a patented dual-conversion process involving the use of enzymes. The remainder of the additional capacity will be used in making special starches, developed by the Staley research organization for use in paper, textile, and other industries.

◆

NEW TITANIUM UNIT AT EDGE MOOR ANNOUNCED BY THE DU PONT COMPANY

Plans for a new manufacturing unit at the Du Pont titanium dioxide plant at Edge Moor, Delaware, were announced November 22 by the company's Pigment Department.

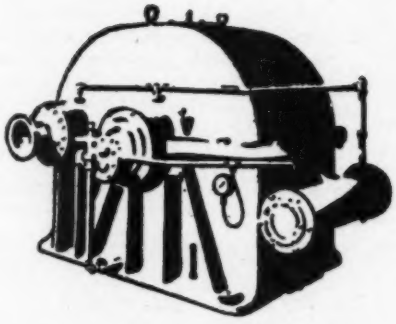
This unit is the second Du Pont titanium expansion to be started since the end of the war and the seventh major expansion in this field which the company has undertaken since it started the manufacture of titanium in 1931. Although the CPA has approved the project, much of the equipment cannot be procured except under long-term delivery. Consequently, completion is not contemplated until 1948.

◆

MONSANTO EXPANSION NEWS

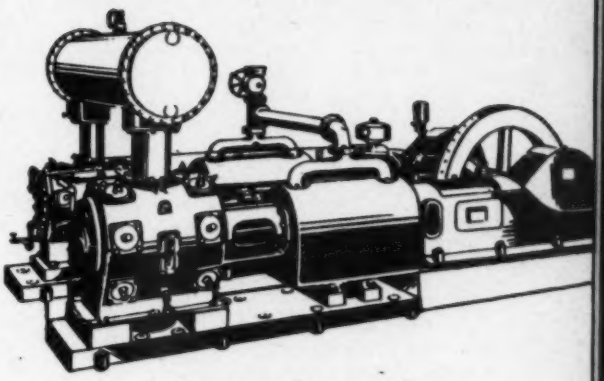
In order to finance the Monsanto Chemical Company's expansion program, a twenty-five year debenture stock issue which will yield $30,000,000 has been placed privately with a group of five insurance companies. The debentures sold at par will bear 2.65 per cent interest and will become due November 1, 1947. The proceeds obtained from the flotation will provide funds for the $10,000,000 purchase from the War Assets Administration of the styrene plant at Texas City, Texas (Cf. P.I. & P. W., October, 1946). The remainder of the sum will be used in payment for other manufacturing commitments which have been made. After ten years a sinking fund will be established to retire half the debenture issue by maturity.

Meanwhile, government approval has been obtained for a $4,000,000 expansion of the Monsanto, Illinois, plant facilities. CPA gave permission to carry out the project when it was shown that materials used in the building of additional plant space would not divert essential materials from the



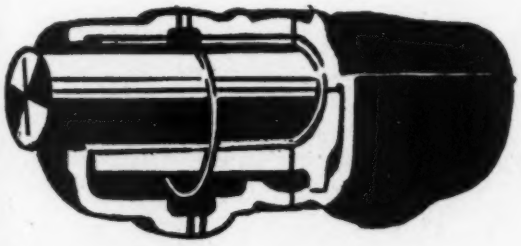
Fewer Oil Changes

in gear cases because the inhibitor in Stanoil prevents excessive acidity and deposit formation over long periods of operation.



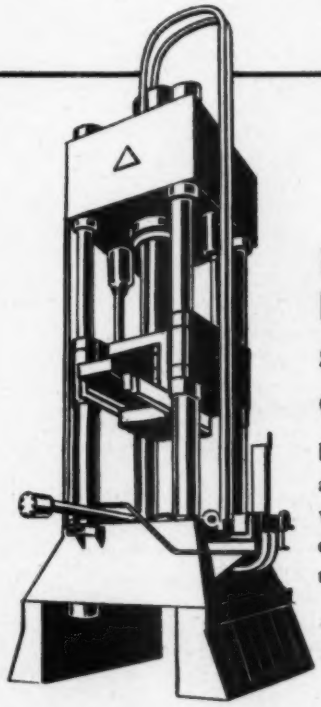
Less deposits in compressors

because the improved oxidation stability of Stanoil resists heat . . . the low carbon forming base oil in Stanoil helps keep valves free from carbon.



Low bearing wear

because of Stanoil's high lubricating quality and because its high viscosity index assures a free flow of the lubricant at starting, and resistance to thinning out as temperatures increase during operation.



Reliable hydraulic system operation

because Stanoil contains an anti-foaming additive which prevents erratic operation caused by air entrained in the oil.

You get all these advantages in one oil . . . STANOIL

For further advantages of Stanoil in many applications in your plant see a Standard Oil Lubrication Engineer.

Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

nation's housing program. The expansion of the Monsanto, Illinois, works involves the enlargement of chlorine and laboratory facilities, new production units for miscellaneous chemicals, enlargement of the wood preservative manufacturing plant, and expansion of the boiler house. The expansion will be substantially completed by the end of 1947.

◆

SANDY HILL BROCHURE WINS 1ST PLACE AMONG ADVERTISING LITERATURE

Outstanding achievement in the field of manufacturer's advertising literature won first place for the Sandy Hill Iron and Brass Works, Hudson Falls, New York, at a contest held in Los Angeles and sponsored by The First Advertising Agency Group, an eighteen year old organization made up of agencies located in all of the nations major cities.

The Sandy Hill brochure was prepared by the Hevenor Advertising Agency of Albany, New York, and presents the line of products manufactured by the concern in twelve sections. The contents include halftone illustrations, artists drawings, and engineering diagrams amplifying the use of Sandy Hill equipment and graphically outlining typical installations. Editorial matter describes the wide range of paper manufacturing equipment which is made by Sandy Hill for the industry.

◆

▶▶▶ EXPANSION OF THE engineering department of the Blackmer Pump Company, Grand Rapids, Michigan, which will provide more extensive development of the company's line of rotary pumps to meet the changing needs of industry, has been undertaken. In line with the expanded engineering facilities of the organization, a new chief engineer, John B. Caldwell, has been appointed, and two senior engineers, L. R. DeWolf and V. A. Brunson, have also been added to the staff.

◆

TRONA PLANT TO EXPAND— A.P. & C.C. TO PROCESS LAKE WATER FIRST TIME

Announcement has been made that the American Potash & Chemical Company will expand its Trona, California, plant to increase the output of soda ash and borax. Construction of the $4,500,000 carbonation plant will begin in 1947. When completed the new development will produce an estimated 60,000 tons of soda ash and 30,000 tons of refined borax, this will substantially aid in reducing the scarcity of these two rare chemicals.

The latest methods of production developed by the A.P. & C.C. research staff will be employed in the new plant. For the first time, secondary brine will be taken from Searles Lake and processed at the plant. This will increase the reserves of raw materials available to the company.

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▶▶▶ A NEW SALES OFFICE to serve the greater Cleveland area was opened December 1 by Monsanto Chemical Company. The office is in the Keith Building, Cleveland. Robert H. Baugh will supervise the office and represent Monsanto's phosphate division sales in the area. T. C. Tupper will represent the company's organic chemicals division, and R. T. Clark the Merrimac division.

◆

▶▶▶ EXPERTS WHO HAVE completed a survey of the German chlorine industry for the United States Army and the Department of Commerce Office of Technical Services have found the horizontal, mercury type chlorine cell to be the predominant design used by the I. G. Farbenindustrie for the production of chlorine and 50-70 per cent high grade caustic soda.

FERGUSON CO. BUILDING TWO NEW PROJECTS FOR IRVINGTON VARNISH CO.

A project consisting of thirteen buildings for manufacturing and three tank farms for the storage of chemicals and raw and processed oils is under construction for the Irvington Varnish and Insulator Company, Newark, New Jersey.

This plant will manufacture "Capseal" products, a line of coated papers, foil and cork combinations used in sealing glass containers. According to The H. K. Ferguson Company, designer and builder, this work will be completed about February 1.

Another plant for the Irvington company has been designed by the Ferguson company. This plant, which will cost approximately $1,500,000, will be used to process the oils from shells of cashew nuts after the meets have been removed.

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▶▶▶ BRANCH OFFICES of the Farrell-Birmingham Company, Incorporated, Ansonia, Connecticut, will be reopened in Chicago. The new office will be located at 120 South La Salle Street. Harry Temporal, who has twenty-six years experience with the company, will be in charge.

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CENTRALIZED OPERATIONS FOR QUIMBY PUMPS TO BE LOCATED IN PITTSBURGH

Reflecting the importance of Pittsburgh as a manufacturing center, H. K. Porter Company, Incorporated, will move two Quimby Pump manufacturing plants from New Jersey. This move will centralize operations in the company's location at 49th and Harrison Streets, Lawrenceville, Pittsburgh, Pa.

The Quimby Pump Company was established in 1893 in New York and subsequently moved its plants to Newark and New Brunswick, New Jersey. In 1943 the Quimby company was acquired by H. K. Porter (Cf. P. I. & P. W., July, 1943). Through expansion of its engineering and development work a wide range of pumps are now manufactured by the Quimby division of H. K. Porter for industrial and marine use.

Locating the pump manufacturing facilities of the company in the Pittsburgh area will extend to industries a quicker and better service.

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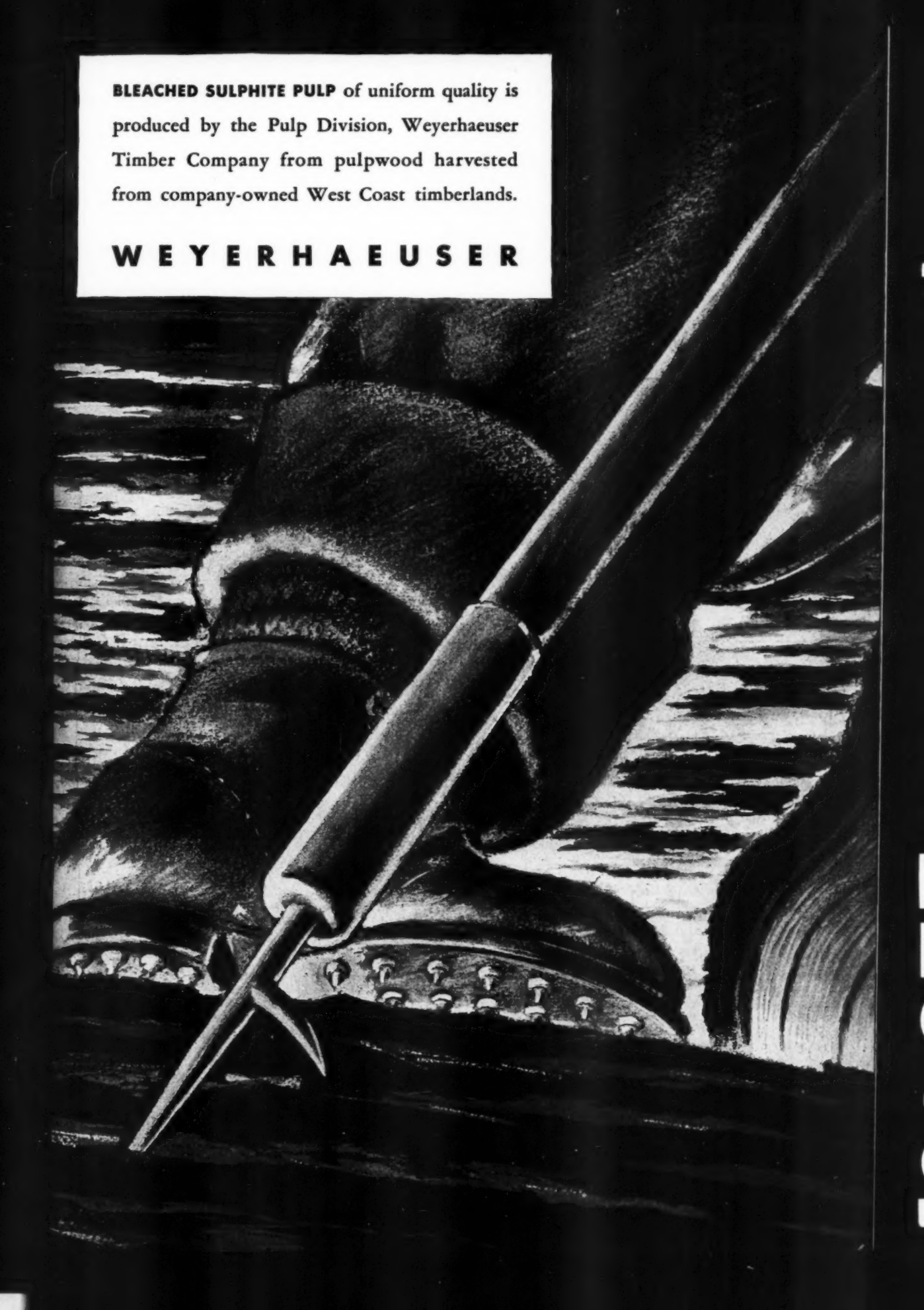
▶▶▶ A PERMIT has been granted for an addition to the power plant of the Northern Paper Mills, Green Bay, Wisconsin; the new development will cost $297,240.


BLEACHED SULPHITE PULP of uniform quality is produced by the Pulp Division, Weyerhaeuser Timber Company from pulpwood harvested from company-owned West Coast timberlands.
WEYERHAEUSER

DATES ANNOUNCED FOR ANNUAL MEETING OF THE CANADIAN TECH. SECTION

The 1947 Annual Meeting of the Technical Section, Canadian Pulp and Paper Association, will be held at the Mount Royal Hotel in Montreal, on January 29, 30 and 31.

Details for the meeting have been settled, and the subjects to be covered in papers which will be read to the assembly will include: slime control, newsprint quality, control of moisture in newsprint manufacture, uses of kraft pulp, alkaline pulping research, tall oil, brown stock refining, a modern sulphite layout, and sulphite acid plant operation. Also, two papers on sulphite bleaching will be read, and surveys of electric motors in the pulp and paper industry, amplidyne machine drive, fluid drives, the Carlsson printing test, the Chapman smoothness tester, physics of water removal, and instrumentation studies, and the use of the British disintegrator for evaluating pulp will be presented.

Additional formal papers are scheduled for presentation covering the drying of paperboard, board manufacture in Scandinavia, the Stapley pulper, stock refining, longitudinal grinding, study of Burr penetration, the grinding of jack pine, and the bleaching of groundwood.

The *Sulphite Committee* has planned a session on the pulping of various woods, and a session on the operation of indirect heating systems. These sessions will feature informal papers and discussion of the subjects considered.

Discussion of the manufacture of kraft papers and the problems of alkaline pulp mill maintenance will be considered by a session of the *Alkaline Committee.*

In a separate session the *Heat and Power Committee* will consider back tender ropes and dryer felt life, and in a second session this committee will discuss infrared and high frequency drying.

The *Board Committee* has assigned a period to the consideration of dry end operation.

Study of the double suction couch and slime control in newsprint mills will be undertaken by the *Newsprint Committee.*

Reports on an ideal groundwood mill layout will be discussed by the *Engineering Committee.*

The final report on "The Utilization of Wood Waste" will be presented by the *Waste Committee.*

Group discussion will be held on the fundamental research program of the Pulp and Paper Research Institute of Canada at the *Wood Chemistry* meeting.

◆

PAPER WEEK

Beginning February 23, 1947, and continuing for four days, the Annual Meeting of the American Paper and Pulp Association will be held at the Waldorf-Astoria Hotel in New York City.

Also, the Annual meeting of the Technical Association of the Pulp and Paper Industry will hold sessions during the same week, these meetings will begin on February 24, and will be held at the Commodore Hotel in New York.

◆

ISO—A NEW INTERNATIONAL STANDARDIZATION BODY

A new body, the International Organization for Standardization, has just been completed by delegates from 25 nations meeting in London. In making the announcement, American Standards Association states the formation of this new group consolidates into a single organization the work of the old International Federation of National Standardizing Associations and that of the war-born United Nations Standards Co-ordinating Committee. The International Electrotechnical Commission, a third important standardizing agency, is expected to join up shortly as its electrical division. This new organization will be known informally as ISO.

The members of ISO will be the national standards bodies. Its work will be carried out through technical committees upon which any country may be represented, if it so desires. The governing body of ISO will be a council containing representatives from 11 countries. Five of these seats are assigned for a period of five years to China, France, Great Britain, the United States of America, and Union of Soviet Social Republics. Others represented initially on the council are Australia, Belgium, Brazil, India, Norway, and Switzerland.

President of the new organization is Howard Coonley, chairman of the Executive Committee of the American Standards Association. Gustave L. Gerard, staff president of the Belgian Standards Association will be vice president.

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▶▶▶ NEWLY ELECTED chairman of the Southern Division, American Pulp and Paper Mill Superintendents Association is James A. Almand, of the Union Bag and Paper Corporation, Savannah, Georgia. Norman U. Dickson, of the National Container Corporation, Jacksonville, Florida, is the retiring chairman. The association met November 14-16, at the George Washington Hotel, Jacksonville, Florida, in joint session with the Southeastern Division of the Superintendents Association.

◆

NEW ENGLAND TAPPI HEARS PROPOSAL THAT COTTON BE GROWN FOR PAPER MILLS

A special committee of the Writing Paper Manufacturers Association proposes that rag-content paper manufacturers form a co-operative enterprise for the growth of Texas cotton especailly for use in paper mills.

This proposal was the highlight of the November meeting of the New England Section of TAPPI, held in Holyoke, Massachusetts. Morris C. Dobrow, executive secretary of the Writing Paper Manufacturers Association and a member of the special committee, outlined the cotton picture arriving at the conclusion that the supply of this material will be inadequate in the future.

Mr. Dobrow described studies made by himself and other members of the special committee: Dr. H. P. Lewis, Institute of Paper Chemistry; and M. D. Bardeen, Lee Paper Company, Vicksburg, Michigan. He feels that the answer to the cotton rag scarcity is a co-operative organization through which the manufacturers can assure themselves of a reliable supply of low-grade cotton in the bale which would be grown on mill-owned land, specially ginned, and shipped to the mills under a special commodity freight rate which he believes can be obtained.

For the Paper Industry

Cotton Rolls	Glassine Supercalenders
Interleaved Rolls	Web Supercalenders
Paper Rolls	Friction Calenders
Embossing Rolls	Embossing Calenders
Chilled Iron Rolls	Laboratory Calenders
Sheet Calenders	Rag and Stock Cutters

Mullen Testers

At the November meeting of the Association, problems of board mills were discussed at a round table session led by Philip Bolton, research director of Robert Gair Company. A similar discussion group on rag cooking and bleaching processes was led by P. M. Goodwin and Edwin Bieniek, both of the American Writing Paper Corporation; and F. S. Klein, of Byron Weston Company.

An informal dinner preceded the sessions, which were attended by 100 members. L. B. Tucker (of Crane & Company), chairman of the Section, announced there would be no December meeting, but that the group will meet again in Holyoke in January.

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REFORESTATION FEATURED SUBJECT AT MEETING OF CHICAGO PRO PAPER GROUP

The subject of "Trees" was the main topic at the regular meeting of the Chicago Professional Paper Group, held November 18. Guest speaker at this meeting of the newest section of TAPPI was M. N. Taylor, executive director of Trees for Tomorrow, Inc.

Reforestation was the subject of Mr. Taylor's talk, and he drew a graphic picture of the need for and the effect of the growing trees upon the paper industry. This subject is being handled scientifically by Trees for Tomorrow, and through the use of charts and diagrams, Mr. Taylor outlined the program being carried out by this organization in the state of Wisconsin.

◆

NATIONAL PAPERBOARD ASS'N ELECTS OFFICERS AT ANNUAL MEETING

The annual meeting of the National Paperboard Association held in New York, November 7, elected George E. Dyke president. Mr. Dyke, who is president of the Robert Gair Company, succeeds W. Irving Osborne to the presidency of the association. W. H. Beckwith, vice president of Morris Paper Mills, was elected vice president.

In a report to the meeting Mr. Osborne stated that paperboard production for the first ten months of the current year reached 6,998,722 tons, an increase of three per cent over 1945, the highest previous year.

◆

▶▶▶ THE FIRST ANNUAL "Protective Packaging Contest" has been organized by the Industrial Paackaging Engineers Association. The contest will be held in conjunction with the association's Second Annual Industrial Packaging and Materials Handling Exposition scheduled for April 29 to May 1, 1947, to be held at the Sherman Hotel, Chicago. Awards will be made for first, second, and third place winners who present packaging devices which provide safety, conform with carrier requirements, show ingenuity, allow ease in handling, and are economical. Mr. I. J. Stoller, vice president of Bradner Smith & Company, is chairman of the Protective Packaging Contest. Rules of the contest and names of the contest judges will be announced at a later date.

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▶▶▶ THE PACIFIC CHEMICAL Exposition which will be held in San Francisco's Civic Auditorium, October 21 to 25, 1947, will not be confined to a representation of exhibitors on the West coast of the United States, but will be an event of international scope. Paul H. Williams of the Shell Development Company, chairman of the exposition committee of the California Section of the American Chemical Society, made that statement, and reported that plans for the show were progressing.

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▶▶▶ TWELVE LECTURES which will be presented at intervals through June 12, 1947, have been scheduled by the National Bureau of Standards and will be held from 7:00 to 9:00 p.m. in room 214 of the Bureau's Chemistry Building in Washington, D. C.

WOOD PULP STATISTICS

The eleventh annual issue of Wood Pulp Statistics, published by The United States Pulp Producers Association, is performing a special service this year because of conditions confronting the pulp and paper industry.

This valuable publication (229 pages) includes data on domestic and foreign pulp and as a reference work will promote a better understanding of the basic trends of wood pulp supply and demand throughout the world. It also will provide a reliable statistical background for company and industry planning. There is a nominal charge for this book which may be obtained from the United States Pulp Producers Association, 122 East 42nd Street, New York 17, N. Y.

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▶▶▶ THE ANNUAL MEETING of the American Standards Association which completed two-day sessions November 22, elected Fredrick R. Lack, vice president of Western Electric Company and formerly vice president of ASA, to the presidency of the Association. Mr. Lack succeeds Henry B. Barns, executive vice president of the Philadelphia Electric Company, to the position. George H. Taber, Jr., who is executive vice president of the Sinclair Refining Company and a member of the board of directors of ASA, was elected vice president of the Association.

◆

COMING EVENTS

Jan. 22—"Quantum Mechanisms of a Microscopic Scale," third lecture of a series sponsored by the National Bureau of Standards and held in Room 214, Chemistry Building, National Bureau of Standards, Washington, D. C.

Jan. 29-31—Annual meeting of the Technical Section, Canadian Pulp and Paper Association, Mount Royal Hotel, Montreal, Canada.

Feb. 23-27—Annual meeting of the American Paper and Pulp Association and paper groups, at the Waldorf-Astoria Hotel, New York City.

Feb. 24-27—Annual meeting of the Technical Association of the Pulp and Paper Industry, at the Commodore Hotel, New York City.

April 28- May 1—Annual meeting of the Chamber of Commerce of the United States, Washington, D. C.

April 29-May 1—Second Annual Industrial Packaging and Materials Handling Exposition, at the Sherman Hotel, Chicago, Illinois.

Oct. 21-25—The Pacific Chemical Exposition, at the San Francisco Civic Auditorium, San Francisco, California.

STATED MEETINGS

Chicago Professional Paper Group meets the third Monday of each month at the Chicago Bar Association, Chicago, Illinois.

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PLUG INTO ANY 110 VOLT A.C. OUTLET

The Cambridge pH meter is always "ready-to-go". It may be turned on continuously during the day so that it is available for pH measurements immediately without waiting through a warming-up period to obtain stability. Another feature of the *Cambridge* is the Electron-Ray Null Indicator. It permits quick, hairline adjustment and cannot be injured by hasty, inexperienced mis-manipulation.

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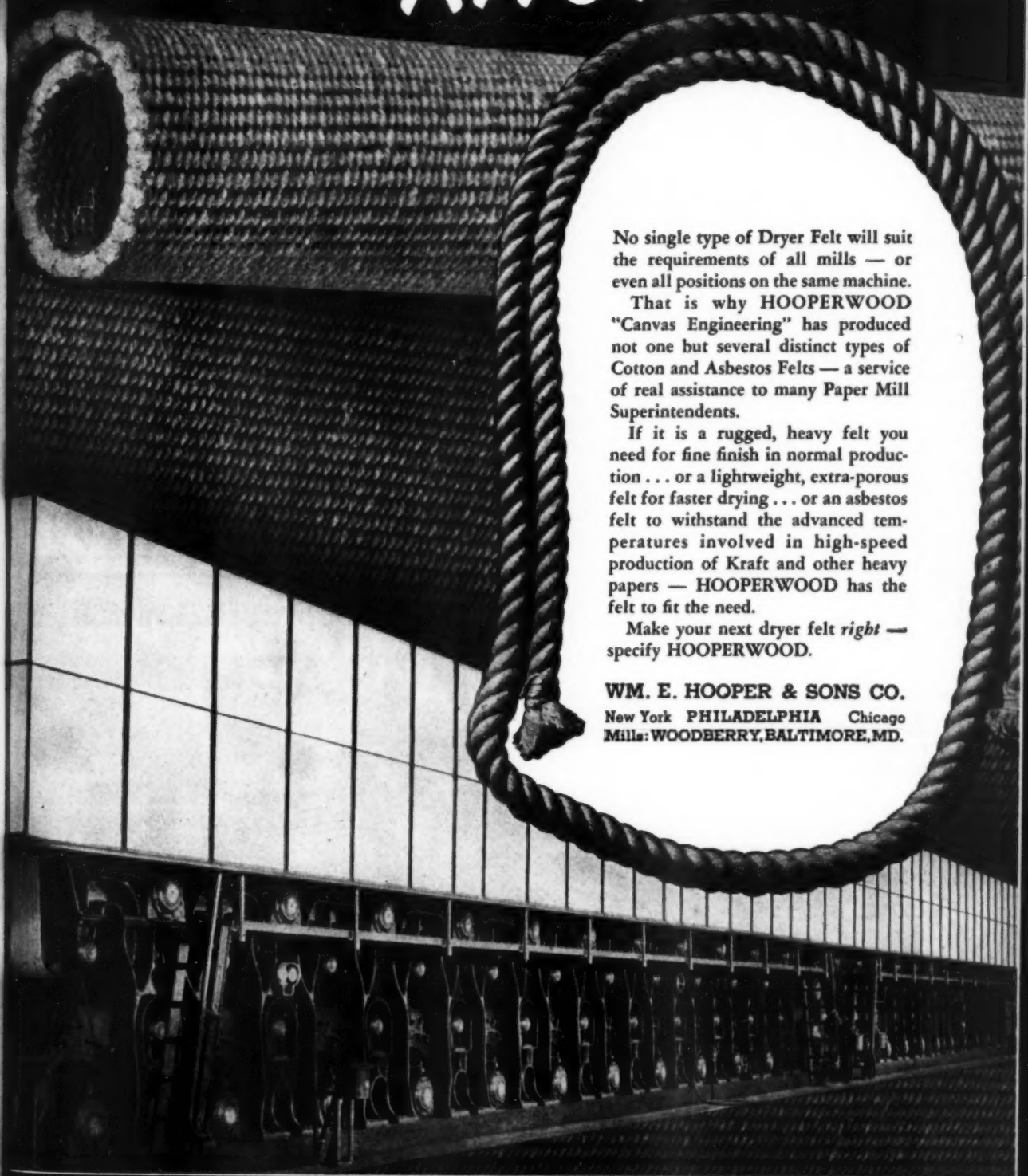
WHAT EVERY PAPER MAKER KNOWS...



No single type of Dryer Felt will suit the requirements of all mills — or even all positions on the same machine.

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If it is a rugged, heavy felt you need for fine finish in normal production . . . or a lightweight, extra-porous felt for faster drying . . . or an asbestos felt to withstand the advanced temperatures involved in high-speed production of Kraft and other heavy papers — HOOPERWOOD has the felt to fit the need.

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HOOPERWOOD DRYER FELTS

COTTON AND ASBESTOS

S A F E T Y

SAFETY SCORES

▶▶▶ PERFECT SCORES are recorded for forty mills at the close of The Paper Industry Safety Contest for the third month, September, 1946.

The frequency rate for all contestants is seven per cent lower for the three-month period of the present contest in comparison with the rate for the same period of the 1945-1946 contest.

Division I—Pulp and Paper Mills

Group A

The Flintkote Co. (Pioneer Div.), Los Angeles, Cal.

Price Bros. & Co., Ltd., Riverbend, Quebec, Can.

Ontario-Minnesota Pulp & Paper Co., Ltd., Kenora, Ontario, Can.*

Group B

P. H. Glatfelter Co., Spring Grove, Pa.

Kimberly-Clark Corp. (Badger-Globe Mills), Neenah, Wis.

International Paper Co., North Tonawanda, N. Y.

Price Bros. & Co., Ltd. (Jonquiere Mill), Jonquiere, Quebec, Can.

Group C

Strathmore Paper Co. (West Springfield Mills), West Springfield, Mass.

Certain-teed Products Corp., Savannah, Ga.

Oswego Falls Corp. (Sealright Div.), Fulton, N. Y.

Certain-teed Products Corp., E. St. Louis, Ill.

Certain-teed Products Corp., Niagara Falls, N. Y.

Certain-teed Products Corp., York, Pa.

Container Corp. of America, Circleville, Ohio.

Crown Zellerbach Corp. (Crown Williamette Paper Co. Div.), Lebanon, Ore.

Group D

Flintkote Co., Little Ferry, N. J.

Marathon Corp., Asland, Wis.

United States Gypsum Co., Oakmont, Pa.

Spaulding Fibre Co., Inc., Milton, N. H.

Strathmore Paper Co. (Woronoco Mill No. 1), West Springfield, Mass.

E. I. du Pont de Nemours & Co., Inc. (Russell Plant), Huntington, Mass.

International Paper Co., Livermore Falls, Maine.

Minnesota & Ontario Paper Co. (Insulite Mill), International Falls, Minn.

Certain-teed Products Corp., Buffalo, N. Y.

American Writing Paper Corp., Albion Division.

Container Corp. of America, Wilmington, Del.

Alton Box Board Co., Carlyle, Ill.*

International Paper Co., Riley, Maine.

Division II—Paper & Board Remanufacturing

Group A

Container Corp. of America, Cleveland, Ohio.

Group B

Old Colony Envelope Co., Westfield, Mass.

International Cellucotton Prod. Co., Inc., Memphis, Tenn.

Bird & Son, Inc. (Roofing Plant), Shreveport, La.

Bird & Son, Inc. (Roofing Plant), Chicago, Ill.

Gaylord Container Corp., Tampa Plant.

Fort Wayne Corrugated Paper Co. (Rochester Div.), Rochester, N. Y.

Container Corp. of America, Philadelphia, Pa.

Thilmany Pulp & Paper Co. (Bag Mill), Kaukauna, Wis.

Flintkote Co. (Hollywood Paper Box Div.), Los Angeles, Cal.

Gaylord Container Corp., Milwaukee, Wis.

Bay West Paper Co., Green Bay, Wis.

* September report missing.

◆

▶▶▶ AN ACCIDENT which terminated fatally, occurred at the plant of Crocker-McElwain Company, Holyoke, Massachusetts, when an employee was caught in one of the press rolls.

New! a visual aid allowing group participation!

IT'S THE SAFETYGRAPH

What news! A visual aid that's ready for action all the time. No special costly equipment, nothing to do but set up the easel, turn the pages, and give the convincing, fast-moving safety talk printed on the back of each page.

What a subject! Safetygraph No. 1 is devoted entirely to "HOW TO LIFT." Every phase of lifting and handling objects is thoroughly covered.

What an idea! The 18 x 24-inch Safetygraph has 16 instructive pages of attention-getting photographs and cartoons emphasizing lifting do's and don't.

What a feature! Permits group participation in on-the-spot discussions. Workers can ask quetions, offer suggestions, and tell their accident experiences without fear of disrupting the meeting. Next time you hold a safety meeting, make it a Safetygraph Meeting!

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PERSONALS

GREAT NORTHERN PAPER CO. BOARD PROMOTES CREIGHTON STANWOOD

At a meeting of the board of directors of the Great Northern Paper Company held in New York City, November 13, Creighton B. Stanwood was elected vice president and manager of manufacture.

Mr. Stanwood is a native of Portland, Maine, and in 1920 after service with the Chemical Warfare Service during World War I, he completed his studies at the Massachusetts Institute of Technology. He joined the staff of the Great Northern mill at Millinocker, Maine, in 1921, as a chemical engineer.

Later in his career, he became steam engineer for the company, and in 1928 he was made superintendent of the bureau of tests. While in this position Mr. Stanwood developed many economies in the company's manufacturing process.

In 1935 Mr. Stanwood was transferred to the Boston office of Great Northern as assistant manager of manufacture, and for the past eleven years he has been closely associated with all phases of the company's manufacturing operations. During the war years he served with the OPA and WPB advisory committee for the newsprint industry.

◆

▶▶▶ Newest member of the Taylor Instrument Companies' sales force, *James H. Easterly*, has just been established in the Northwest with headquarters in Seattle, Washington. Since his discharge from the Army, Mr. Easterly has completed a training and refresher course at the home office in Rochester before taking up the work in Seattle. Although this is his first territory, he became associated with the company since 1941; he entered the service in 1942.

▶▶▶ Manager of the Glidden Company's vegetable oil division at Buena Park, California, is *W. W. Stephens*, who succeeds *L. C. Barlow*, manager of the division since it first began operation. Mr. Stephens has been with the Glidden Company since 1930 having been associated with the New York, Cleveland, and St. Louis offices of the company. He was appointed assistant manager of the Buena Park division in April of this year.

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▶▶▶ A new position, that of mill manager with the St. Regis Paper Company, Kalamazoo, Michigan, has been accepted by *Lester Smith*, formerly mill manager of the Combined Locks Paper Company, Combined Locks, Wisconsin.

◆

▶▶▶ A newly created Falk Corporation sales territory will be headed by *L. H. Billings*, formerly production manager. He will be district manager in Wisconsin, Upper Michigan, and parts of Iowa. Following the promotion of Mr. Billings, Harold F. Falk, works manager, announced that *B. C. Bugbee*, who has been assistant to the works manager, will take over the position of production control manager.

L. H. Billings

B. C. Bugbee

UNION BAG FORESTRY SCHOLARSHIPS ARE WON BY 4-H CLUB MEMBERS

As part of its program of forestry education, the Union Bag & Paper Corporation, Savannah, Georgia, has offered scholarships in forestry to the University of Georgia School of Forestry.

Donald Stewart (left) and Jimmie Snowden, first winners of forestry scholarships offered by Union Bag & Paper Corporation

The first two winners of these scholarships were recently selected because of outstanding achievement in 4-H Club forestry projects. These two young Georgians, Donald Stewart, of Thomas County, and Jimmie Snowden, of Ben Hill County, will receive $400 each for four years from Union Bag while pursuing their forestry studies at the University.

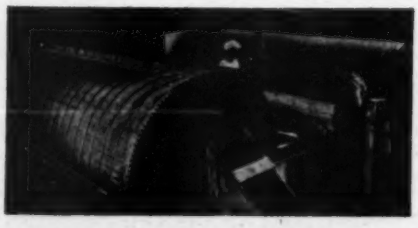
◆

▶▶▶ An addition to its sales staff has just been announced by Bulkley, Dunton and Company, Inc., New York City. *Robert E. Estes*, who for the past twenty years has been associated with the Standard Paper Manu-

How to make your CYLINDERS and VACUUM DRUMS last longer

FOR STRENGTH AND RESISTANCE
to wear and corrosion, this typical paper machinery cylinder utilizes structural rods, wire cloth and winding wire of Monel. *Photo courtesy of Cosgrove Wire Cloth Co., Belleville, N. J.*

LEAVING THE ROLLING MILL.
A shipment of Monel structural rods for cylinder molds. These rods are stiffer and more corrosion-resistant than other non-ferrous materials used for this purpose.



MONEL WIRE CLOTH FILTERS
at work screening the fresh water supply in a large Eastern plant. Available in all commercial weaves, meshes and widths, the Monel wire cloth used here was supplied by *The W. S. Tyler Co., Cleveland, Ohio.*

HERE'S one effective way of increasing cylinder and drum life. *Use Monel.**

Start with the structural rods on which your wire and wire cloth covers are wound.

Monel structural rods are rigid... and highly resistant to paper stocks and sours. They do not react galvanically when in contact with brass and copper parts. Their corrosion resistance is greater than that of commonly used non-ferrous materials, and they are almost twice as stiff.

Because of this high rigidity, it is often possible to reduce both the weight and cost of equipment by using small-diameter Monel rods.

Another suggestion: switch to Monel wire cloth and winding wire. Both resist pulps, paper mill stocks and white waters, caustic liquors and cleaning solutions of dilute muriatic and sulfuric acids.

On cylinders and drums used for

—washing and thickening pulp
—making pulp laps on wet machines
—recovering fibre and fillers on save-alls

Monel is long-lasting. Permits fast and improved production. Helps lower maintenance expense.

For further information, consult your regular source of supply. Or—if you prefer—write us.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

NICKEL (INCO TRADE MARK) **ALLOYS**

MONEL

"MONEL" • "K" MONEL • "S" MONEL • "R" MONEL • "KR" MONEL • INCONEL • NICKEL • "L" NICKEL • "Z" NICKEL
*Reg. U.S. Pat. Off.

facturing Company, will be in charge of B-D paper sales to book publishers. Mr. Estes has had long experience with well known paper manufacturing companies, and has a well-rounded knowledge of all places of manufacturing, sales, and merchandising.

◆

JOHN L. HOBSON SUCCEEDS LATE FATHER AS PRESIDENT

Succeeding his father, the late Arthur L. Robson (See Necrology), John L. Hobson has been appointed president of the St. Croix Paper Company, Woodland, Maine.

Following his discharge from World War I, the new president joined St. Croix in 1919, and 1929 he was made treasurer of the company, later being elected vice president.

During World War II, Mr. Hobson was vice chairman and chairman of the OPA advisory committee representing the newsprint industry; he was also chairman of the WPB advisory committee representing the same industry.

◆

▶▶▶ Two new vice presidents of American Brake Shoe Company were elected from executives of that company's divisions by its board of directors on November 13. The new officers of the parent organization are: *Thomas W. Pettus*, president of National Bearing Division, and *Joseph B. Terbell*, executive vice president of the American Manganese Steel Division.

Thomas W. Pettus

Joseph B. Terbell

◆

▶▶▶ Manager of industrial relations, a newly created position in the organization of the Calco Chemical Division of the American Cyanamid Company, Bound Brook, New Jersey, has been taken over by *Horace D. Acaster*. Production supervisor was the position held by Mr. Acaster when he came to Calco in 1926. Since then he has undertaken several important assignments for the company; and he is eminently qualified by experience for his new post.

◆

▶▶▶ At present superintendent of the Hercules Powder Company's Synthetics Department plant at Mansfield, Massachusetts, *Donald A. Bunce*, will take over his new position as manager of the new Burlington, New Jersey, chemical plant January 1, 1947. The Burlington plant which will produce synthetic resins and other chemicals is scheduled for completion in January. This latest Hercules development is described as among the most modern synthetic resin plants.

◆

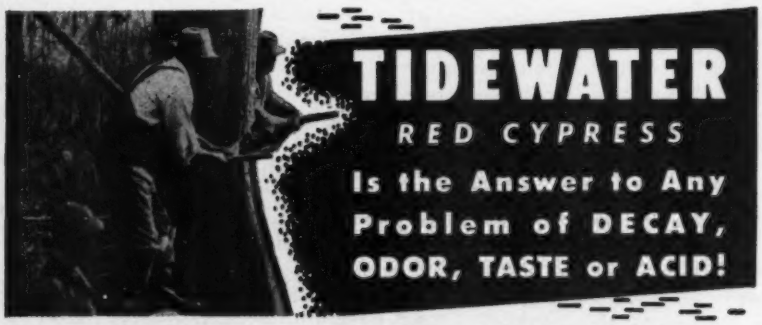
▶▶▶ Resigning as director of the United Paperboard Company, New York City, *James Todd, Jr.*, has been succeeded by *P. M. Loddengaard*, who was elected to the board at a meeting of the company's stockholders November 21.

◆

▶▶▶ Appointment of *W. E. Gilbert* as manager of the processing equipment division of the Detrex Corporation, Detroit, Michigan, has been announced. Mr. Gilbert's new duties will direct his attention to the many phases of automatic cleaning and finishing machines, rust proofing systems, dip tanks and aluminum processing equipment.

◆

▶▶▶ Effective November 1, *Arthur E. Jacobs* took over the duties of his new office as vice president and sales manager of Blackmer Pump Company, Grand Rapids, Michigan. Mr.



...Its Superior Qualities Make It Ideal for a Wide Range of Industrial Uses

The Indians knew it, the Spaniards knew it, the French knew it, and those of English descent of the Southeastern regions have known for 150 years the superior qualities of Tidewater Red Cypress and its resistance to decay. Along the Atlantic Coastal Plain where lie buried cypress trees that grew over 100,000 years ago in the Pleistocene Age, many of which have since been dug up, give mute evidence of the lasting qualities of cypress never equalled for its decay resistance. In more recent years industry has also learned that it licks the difficulties of odor, taste and acid. Tidewater Red Cypress has ALL the qualities you demand for many specific industrial demands.

Tidewater RED CYPRESS

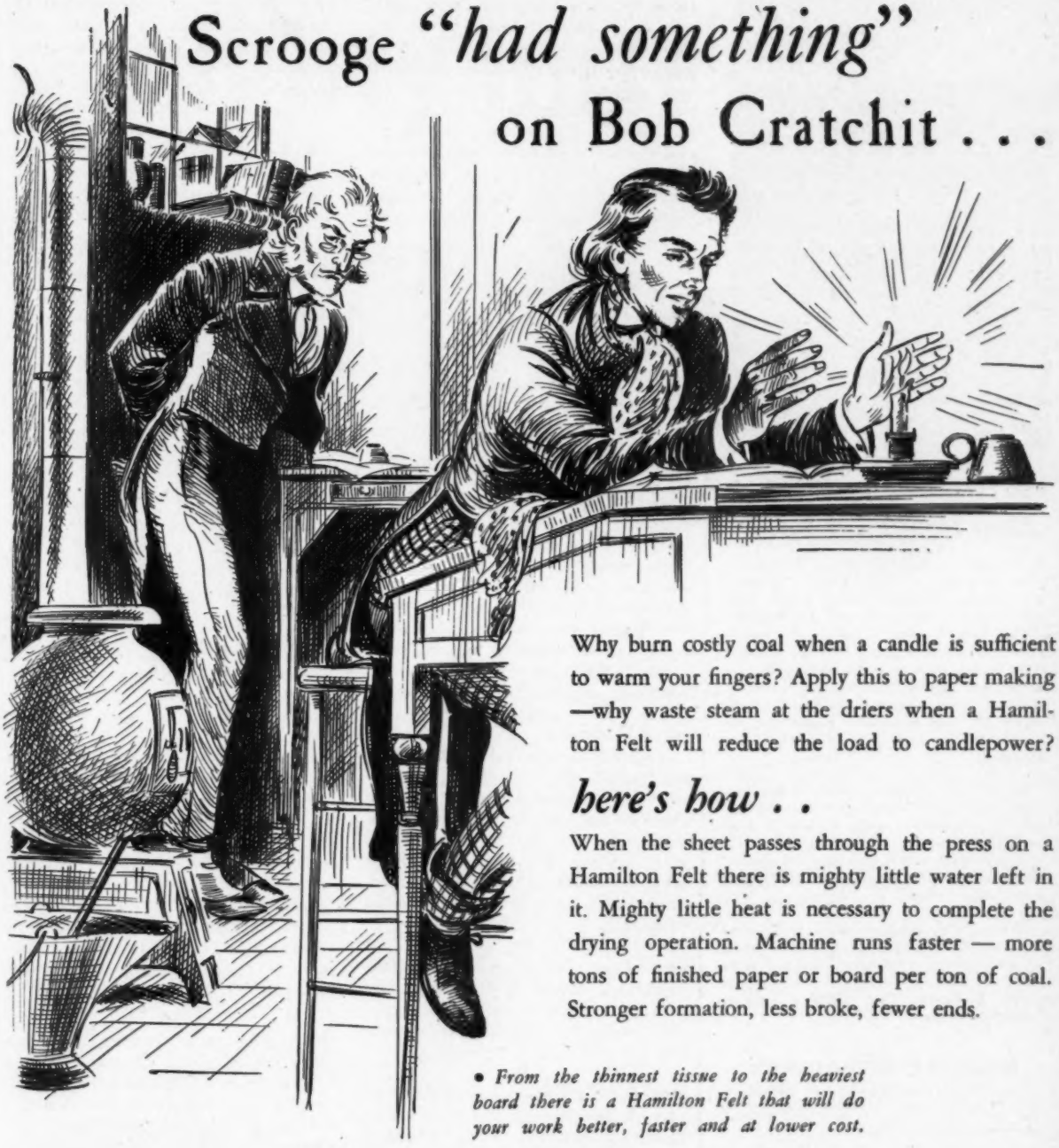
Tidewater Red Cypress "The Wood Eternal"

CAN BE FURNISHED FROM ST. LOUIS STOCKS

FLEISHEL LUMBER CO.

4234 DUNCAN AVE. • ST. LOUIS 10, MO. • NEwstead 2100

Scrooge *"had something"* on Bob Cratchit . . .



Why burn costly coal when a candle is sufficient to warm your fingers? Apply this to paper making —why waste steam at the driers when a Hamilton Felt will reduce the load to candlepower?

here's how . .

When the sheet passes through the press on a Hamilton Felt there is mighty little water left in it. Mighty little heat is necessary to complete the drying operation. Machine runs faster — more tons of finished paper or board per ton of coal. Stronger formation, less broke, fewer ends.

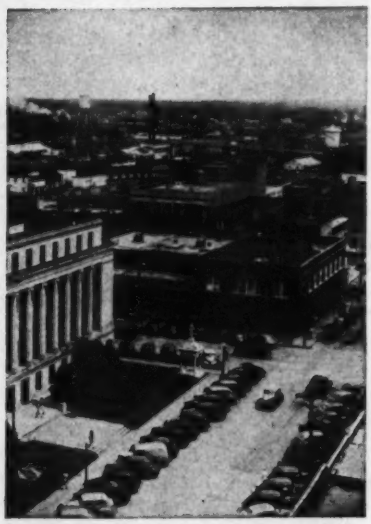
• From the thinnest tissue to the heaviest board there is a Hamilton Felt that will do your work better, faster and at lower cost.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

• **Miami Woolen Mills** •

Hamilton Felts

• **Established 1858** •



Ask EL DORADO, ARK.

About Layne Water Systems

El Dorado, fabulous oil city in Arkansas—alive, growing and becoming a greater and greater industrial center, knows, likes and depends exclusively on Layne Well Water Systems. The City, Oil Refineries, Railroads, Power & Light Services and various Petroleum Industries—all—100 per cent, have Layne Well Water Systems. Such a record means that the name, Layne, stands for high efficiency, longer life, superior quality and proven operation economy.

Layne high efficiency Well Water Systems are world famous in advanced engineering features—world proven in lasting quality and the lowest of all in operation cost. Each unit is specifically designed, manufactured and installed to fulfill your exact requirements.

If your city, industry, railroad, air conditioning or irrigation project is in need of more water at greater economy, write for late catalogs, bulletins, etc. Address Layne & Bowler, Inc., General Offices, Memphis 8, Tenn.

HIGHEST EFFICIENCY

Layne Vertical Turbine pumps are available in sizes to produce from 40 to 16,000 gallons of water per minute. High efficiency saves hundreds of dollars on power cost per year.

AFFILIATED COMPANIES: Layne-Arkansas Co., Stuttgart, Ark. * Layne-Atlantic Co., Norfolk, Va. * Layne-Central Co., Memphis, Tenn. * Layne-Northern Co., Mishawaka, Ind. * Layne-Louisiana Co., Lake Charles, La. * Louisiana Well Co., Monroe, La. * Layne-New York Co., New York City * Layne-Northwest Co., Milwaukee, Wis. * Layne-Ohio Co., Columbus, Ohio * Layne-Pacific, Inc., Seattle, Wash. * Layne-Texas Co., Houston, Texas * Layne-Western Co., Kansas City, Mo. * Layne-Western Co. of Minnesota, Minneapolis, Minn. * International Water Supply Ltd., London, Ontario, Canada * Layne-Hispano Americana, S. A., Mexico, D. F.

LAYNE

WELL WATER SYSTEMS
VERTICAL TURBINE PUMPS

Jacobs formerly was general sales manager of the Pump Division of George D. Roper Corporation, Rockford, Illinois, and has, for more than 30 years, been engaged in the design, production, and marketing of industrial equipment. He is now serving as chairman of the Rotary Pump Section of the Hydraulic Institute, which is the national association of industrial pump manufacturers.

NECROLOGY

ARTHUR L. HOBSON

President and one of the founders of the St. Croix Paper Company, Arthur L. Hobson, passed away November 9. Mr. Hobson had made his home in Boston for many years, earlier having resided in North Hampton. He was born in Haverhill, Massachusetts, and attended school there. In 1895, Mr. Hobson was graduated from Harvard; and he began his papermaking career in Berlin, New Hampshire, later becoming associated with the International Paper Company, at Lawrence, Massachusetts.

Together with his father, Mr. Hobson founded the St. Croix Paper Company at Woodland, Maine, at the same time, he aided in the development of waterpower on the St. Croix River in that state. In 1904, Mr. Hobson became treasurer of the St. Croix company, and in 1926 he succeeded to the presidency.

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▶▶▶ Long time representative of the Fairbanks, Morse & Company, and manager of the company's Washington office, *R. E. Post*, passed away November 13.

◆

▶▶▶ *E. G. Amos, Jr.*, son of the secretary of the Salesmen's Association of the Paper Industry, was the victim of an automobile accident which caused his passing. The younger Amos was attending Michigan State College at Lansing, Michigan, where the accident occurred. During the war he was shot down on his second mission flying as a bombardier with the Army Air Force over Germany, and for six weeks he was listed as missing before details of his capture were learned by his parents. At the end of hostilities with Germany, Mr. Amos was liberated from a Prisoner of War camp. He returned to the States and enrolled at Michigan State in a course in hotel management.

▶▶▶ Power plant superintendent of the Georgetown, South Carolina, mill of the Southern Kraft Division, International Paper Company, *Warren S. Flenniken*, passed away November 1. He had been connected with the company since 1932, and he had been with the Georgetown organization since 1937. Prior to his association with the latter plant, Mr. Flenniken had been with the company's Panama City (Florida) mill.

◆

▶▶▶ *Willian Littell Raymond*, long time leader in the Salesmen's Association of the Paper Industry passed away November 11, at his home in Upper Montclair, New Jersey. Mr. Raymond was manager of the New York office of the P. H. Glatfelter Company, with which company he had been associated for fifteen years, following fifteen years service with the International Paper Company. He was a former president of the Salesmen's Association and for a number of years he had arranged the great annual luncheons. Mr. Raymond is survived by his widow, one son, and three daughters.

◆

▶▶▶ Salesman for E. C. Atkins and Company, *R. B. Nixon*, who retired in 1945, passed away October 7. Mr. Nixon was born in Canada but spent most of his life in the United States. He became associated with Atkins in 1907. At the time of his retirement Mr. Nixon was 82 years. He was a member of the Atkins Pioneer Club and the "Old Guard," an honorary group of southern salesmen. Another Atkins old-timer, *Clarence A. Newport*, passed away recently at the age of 80. He became associated with the company in 1886 and had been secretary of the Atkins Pioneer Club for the past 39 years.

◆

▶▶▶ Manager of the New York office of P. H. Glatfelter Company (Spring Grove, Pa.), *William Littell Raymond*, passed away November 11. A native of South Norwalk, Connecticut, and an infantry officer during World War I, Mr. Raymond was connected with the Glatfelter concern for fifteen years.

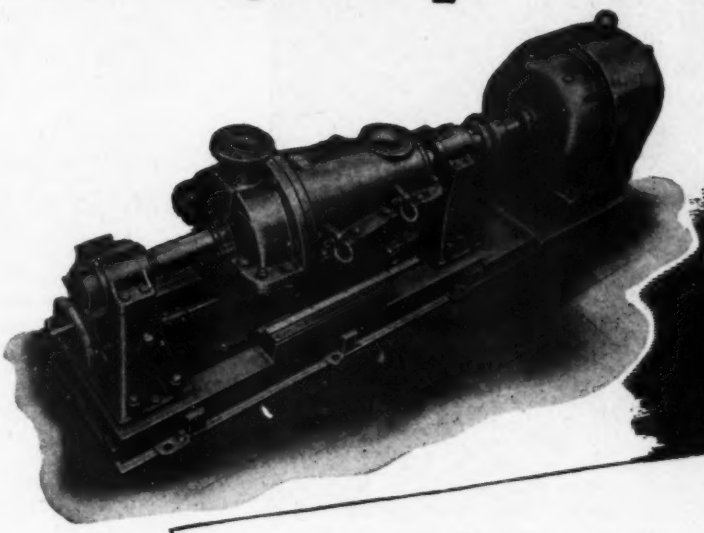
◆

▶▶▶ For half a century an employee of the Gilbert Paper Company, Menasha, Wisconsin, *Henry G. Vanderhyden*, passed away November 16.

◆

▶▶▶ Engineer for the Rising Paper Company, Housatonic, Massachusetts, and for forty years an employee of the company, *Daniel F. Fitzgerald*, passed away October 24 at his home in Great Barrington, Massachusetts.

a mighty mite for stock preparation



THE JONES *High Speed* REFINER

APPLICATION No. 7:—
In a glassine mill, two 60 H.P. High Speed Refiners replaced one large Jordan, saving 80 H.P., and also resulted in attaining a greater improvement in formation of sheet.

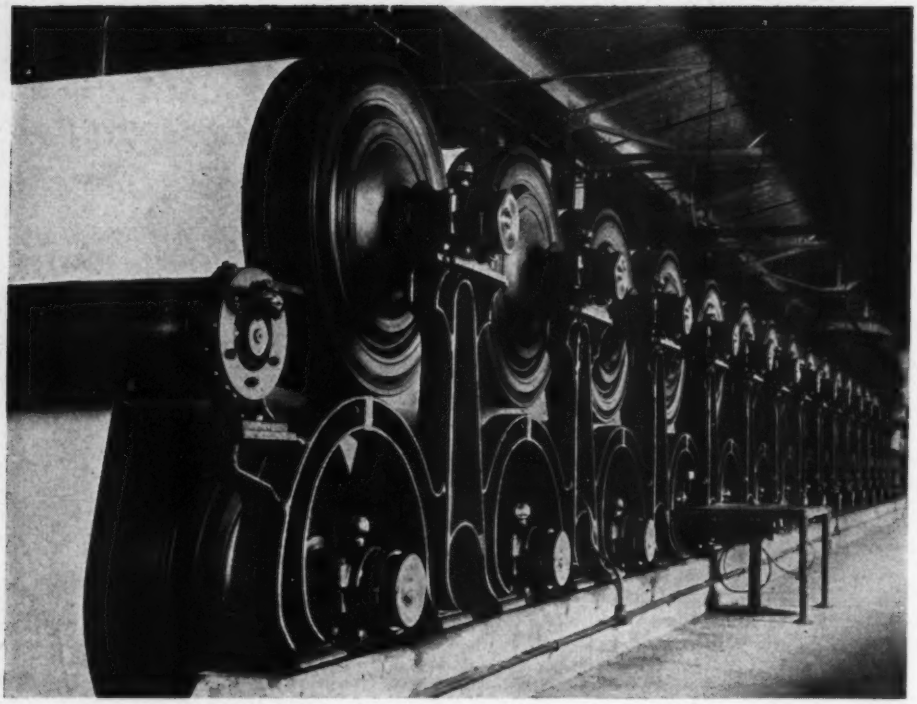
APPLICATION No. 8:—
In another glassine mill, one 60 H.P. High Speed Refiner made possible the elimination of three lava filled beaters.

APPLICATION No. 9:—
In a mill making rag and sulphite specialties, one 50 H.P. High Speed Refiner is doing the work of a 150 H.P. Jordan formerly used.

Jones

E.D. JONES & SONS COMPANY-PITTSFIELD, MASS.
Builders of Quality Machinery for Paper Mills

MANUFACTURERS AND DISTRIBUTORS IN CANADA: WATEROUS LTD., BRANTFORD, ONT.



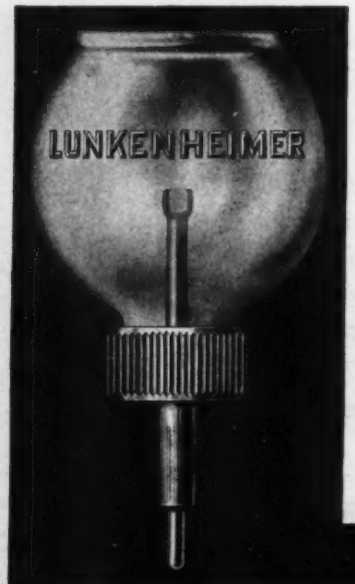
Lunkenheimer "Visible" Bottle Oilers on roller shaft bearings of paper-making machine, at Taylor Fibre Company, Norristown, Pa. This machine manufactures paper used for Taylor Vulcanized Fibre and paper-base grades of Taylor Phenol Fibre.

Widely Used In American Industry

LUNKENHEIMER *Visible*

BOTTLE OILERS *Lubricate Bearings Dependably... Save Time, Labor, Oil and Trouble*

Fig. 1815
BOTTLE OILER
Globe Body
Fully automatic, insures efficient, uniform, economical lubrication of bearing. Feeds oil only when shaft is in motion.



Old-fashioned hand oiling methods have no place in the otherwise streamlined efficiency and economy of modern industry. Such laborious, costly operations are a steady drain on profits.

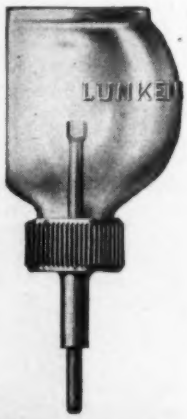
Industries the nation over have found an answer to this excess-cost lubrication problem—in LUNKENHEIMER "Visible" Bottle Oilers. These efficient, dependable Oilers are fully automatic, and being always in clear view, can easily be checked. They feed the right amount of oil, in the right way, at the right time, to the right place... and only when the bearings are in operation. When machinery stops, the oil feed stops.

With these Oilers there is no wastage or hazard due to oil spilled on floors, no oil drip on product, and none of the loss of time incident to frequent hand oiling. Plant production is speeded up... machinery and repair costs lowered... power consumption reduced... fire and accident possibilities lessened. Descriptive circular No. 560 available on request.

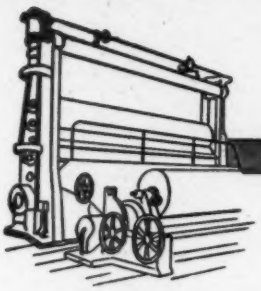
SEE YOUR LUNKENHEIMER DISTRIBUTOR

Lunkenheimer Distributors are located in principal industrial centers. There is one near you, fully equipped to assist with your maintenance and operation problems. Call on him!

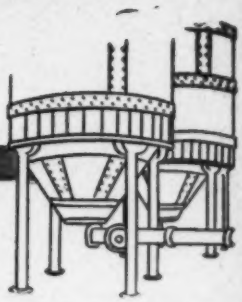
Fig. 1816
BOTTLE OILER
Flat Side Body
For use where space does not permit installation of Globe Body Oiler. All operating features same as in Fig. 1815.



THE LUNKENHEIMER CO., Cincinnati 14, Ohio
NEW YORK 13, CHICAGO 6, BOSTON 10, PHILADELPHIA 7.
EXPORT DEPARTMENT: 318-322 HUDSON ST., NEW YORK 13, N. Y.



Practical SHORTS



Readers are invited to submit short, practical articles for this department. The items should be original and should relate to ways and means of handling production and maintenance jobs. Where possible, articles should be illustrated. Rough sketches only are required. Payment will be made for acceptable items upon publication.

Rubber Glove Care

The importance of plain soap and water in preventing industrial dermatoses is illustrated in the method for cleaning and sterilizing rubber gloves devised by G. E. Thiel of TWA. Having observed that skin irritations resulted from the improper use and cleaning of protective gloves, he devised a procedure which has entirely eliminated the trouble. According to his report in *Occupational Hazards* (8:37, July, 1946) the proper handling of gloves is as follows:

1) Gloves are issued to employees on a tool check. They must be returned when the job is completed or at the end of the shift.

2) No employee is allowed to borrow or use gloves issued to another employee.

3) Gloves returned to the tool room are placed in a metal container and are not reissued until cleaned.

4) As an added precaution, no gloves are ever returned to stock after being turned in by employees, even though they may not have been used.

5) Gloves are cleaned at least once daily, or more often if many are used.

The method of cleaning and sterilizing gloves is as follows:

A) Four metal containers (size 24″ x 24″ x 8″) are used—one for storing used gloves in the tool room; one for the soap bath; and two for rinsing in clear water.

B) Gloves are first washed with a good liquid soap, both inside and out.

C) Rinse in clear water to remove soap.

D) Soak for at least five minutes in a sterilizing agent consisting of a 4 per cent solution of Lysol and Westamin. (Any agent that will not harm glove material.)

The container for storing the gloves in the tool room is used for this purpose, as it is then clean for further use.

E) Gloves are again rinsed in clear water.

F) They are then dried both inside and out, finished right side out, and dusted with soapstone or talc to prevent sticking.—Association of American Soap & Glycerine Producers.

◆

Welding of Oil-Soaked Castings

Occasionally it is necessary to weld cast iron machine parts that have become so soaked with oil after years of use that normal cleaning procedures are inadequate. Fusion welding is usually preferable for such applications The parts should be thoroughly preheated to burn out as much of the oil as possible and should then be welded with cast iron welding rod, using a tip one size larger than would be normally required. The larger flame assists in floating out the scum.

Where it is desired to bronze-weld such a part, heating the surface to be welded to a bright red will often serve to clean the surface sufficiently so that regular bronze-welding technique can be applied. —The Linde Air Products Company.

◆

Assembling Copper Tubes With Flared Tube Fittings

Cut the tube to the length required with a hacksaw. (32 teeth to the inch.) Make certain that the tube ends are cut square. Special vises with saw guides are readily available. If the size and gauge of the tube permit the use of a disc cutter, the cuts will be square and clean, requiring a minimum of preparation for flaring. Ream the inside of the tube and remove burr on the outside.

Slip the sleeve-nut section of the fitting over the end of the tube, with threaded side of fitting facing end of the tube to be flared (Figure 1). Insert the correct size flanging tool into the tube end, being careful that it is correctly centered. (It is good practice to lubricate this tool with a drop of oil before driving it into the tube.) Drive the flanging tool with a hammer, striking it squarely in the center, until the tube is flanged to the outside diameter of the tool (Figure 2).

Inspect the surfaces of the connection for cleanliness, insert the male section of the fitting into the sleeve nut and draw tight with a wrench (Figure 3). Avoid springing the tube or putting undue strain on the fitting.—The American Brass Company.

◆

Tips on Grinding Chilled Iron Rolls

Take light cuts. A light cut does not wear the wheel as rapidly and the diameter of the roll is apt to be more uniform throughout its length. Experienced operators are able to determine the approximate depth of cut by listening to the cutting sound of the wheel. The proper work speed depends mostly on the proportions of the roll and the finish requirements. It appears to be common practice to run chilled iron rolls up to 20 inches in diameter at about 85 surface fpm and rolls larger than 20 inches at about 110 surface fpm. Long, slim rolls have a tendency to whip and set up vibration which can be offset by reducing their speed.

Clean, carefully filtered coolant, directed between the wheel and the work in a generous flow, is essential for a surface that is to be perfectly round and free from scratches and other imperfections. On the two-wheel type of roll grinder,

Left to right: Fig. 1—Slip on sleeve-nut before flaring; Fig. 2—Strike flanging tool squarely for uniform flare; Fig. 3—Flared join should seat freely before tightening

care must be taken to have the coolant fed over the grinding wheel that is running down. In this position, the water is carried by the roll to the other wheel. Strong alkali coolants should be avoided as these have a tendency to attack the shellac bond, resulting in rapid wheel wear and scratches on the roll surface.

Operators who are troubled with chatter marks should make sure that the wheel spindles on their machines are not loose, the driving dogs are not too tight (or too loose), the grinding solution of the correct strength, and the grinding wheels not too hard. In grinding long, slender chilled iron rolls, it is sometimes necessary to raise the roll above centers in order to eliminate chatter marks. Due to its own weight, the center of the roll sags below the center line of the wheels and by shimming up the bottom gib (on two-wheel grinders) and raising the center line of the roll ⅛ inch to ¼ inch above the center line of the wheels, the grinding action is improved perceptibly.

It is desirable to use a special roll caliper to check the roll for roundness and straightness (or amount of crown). The indicator needle should not deflect if the roll is perfectly round. To prevent the caliper from chattering, the roll should be wiped with the grinding solution or oil.—NORTON COMPANY.

◆

How to Pour Bearings

Fundamental in the making of good bearings is the selection of an alloy having the proper physical properties, hardness and compressive strength, freedom from segregation, and good grain structure. Aside from the fact that the selection of such an alloy is a necessity in order to secure dependable long life bearings, the procedure followed in casting is also tremendously important if good bearings are to result. Even the best babbitt can fail in service if a few fundamental pouring rules are not followed.

For every large plant or shop that is completely equipped for pouring bearings, and staffed with skilled maintenance men who have had considerable experience in casting babbitt, there are dozens of other plants that follow no established routine in pouring the relatively few bearings that they are called upon to produce each year. The task may be delegated to an inexperienced workman, or perhaps to anyone in the shop who happens to have time on his hands. Under such circumstances, all too often the results fall considerably short of the near 100 per cent job that could be secured.

There are many ways in which bearings can be poured, with assurance of equally good results. However, experience has proved that if the basic principles of heat transfer from molten metal through the bearing shell are observed, good bearings with lining tight against the shell should be obtained, regardless of the particular set-up or method that is followed. The average plant or shop usually has or can readily devise the equipment and fixtures that are required. From this point on, it is only necessary to follow a few simple, fundamental rules.

Purity of Bearing Metal

It pays to always use new babbitt, made of virgin metals. When you have decided upon the proper grade for the service involved, do not mix with reclaimed or scrap metal of unknown analysis. While it might appear that re-using old metal is one way to save on bearing costs, it is seldom wise to try and economize by mixing old, used metal with new. Too often dirt or other harmful foreign matter will be included, or metals of unlike analysis may not produce the dense, close grained structure required to successfully resist wear. If a sizable quantity of old metal is accumulated, this can be used for pouring secondary bearings where loads are light and the performance required is less exacting.

Cleaning and Preparing Equipment and Shell

Using a wire brush, clean all equipment, fixtures and the inside of the shell thoroughly. Follow this with a blowtorch and further brushing if necessary. The blowtorch also serves to drive out all moisture from the bearing shell, which is important. The mandrel should be as thin walled as possible, with ends closed with wood plugs to prevent heat loss.

Put a waste head on top of the shell. This takes care of the problem of shrinkage as the bearing solidifies, assuring sufficient metal to completely fill the bearing area. The waste head is made of a putty-like substance that is especially prepared for the purpose, and as it does not dry out may be used over and over again. The height of the waste head depends upon the size of the bearing . . . larger bearings requiring more excess metal at the top to make up for shrinkage.

Melting the Bearing Metal

Before you start to melt, make sure that you have sufficient babbitt to pour the entire bearing at one time. This is necessary in order to secure a dense and completely uniform structure. The melting pot should be placed close to the work . . . the closer the better. This will prevent heat loss in ladle as the molten metal is transferred from the pot to the bearing fixture.

Follow the manufacturer's recommendation for correct pouring temperature. Generally speaking, a temperature of from 850 to 950 degrees F. is sufficient. After the babbitt is completely molten, the best pouring temperature is related to the thickness and size of the bearing being poured. The metal should pour about like water. Heating to a slight excess is not harmful . . . the only disadvantage being the accumulation of a higher percentage of dross resulting from oxidation. Thick, heavy bearings can be successfully poured at a lower temperature than bearings that are long and thin. The metal must be hot enough to reach the bottom of the mould and start to build up before any sign of setting occurs. One simple method of checking to determine if the metal has reached the correct pouring temperature is to insert a small, dry pine stick in the pot. It should burst into flame immediately upon contact with the hot babbitt.

Pouring the Bearing

Before starting the pouring operation, warm the bearing shell to a temperature of about 200 degree F. As previously stated, this serves to drive out all moisture and also prevents too quick or non-uniform solidification of the molten metal.

Fill the space completely and as rapidly as possible, continuing pouring until the top of the waste head is reached. Cool the bearing shell by applying water or wet rags, starting at the bottom and working slowly upward. By thus drawing the heat outward, the metal starts to solidify at the inside surface of the shell, adhering tightly to the wall. As the babbitt sets and contracts in this area, the void is filled with hot metal from the mandrel side which in turn is fed from the surplus metal provided by the waste head at the top of the shell.

When the metal has completely cooled and set, if the bearing has been properly poured the mandrel should not stick but should free itself from the fixture with little effort.

While conditions and facilities will vary from shop to shop, nevertheless if the foregoing simple, basic rules are followed there is no reason why every bearing produced should not be sound, dependable and capable of giving the long, trouble free service that is expected of it.—*K. T. MacGill, Manager Babbitt and Bearings Division,* JOSEPH T. RYERSON & SON, INC.

◆

Rubber Transmission Belting

Dust on the driving surface of the pulley or on transmission belting frequently produces slippage. It may be removed by washing the belt with soap and water or by brushing. The pulley should also be scraped clean. If a wire brush is used, be careful not to injure the belt surface.

If driving surface becomes glazed, first brush the belt, then apply belt dressing as illustrated. Do not use mineral or animal oils, since these have a deteriorating effect on rubber. Castor oil has been proven highly desirable for this purpose. Excessive oil should in all cases be wiped away.

A small amount of take-up is frequently useful in reducing slippage.

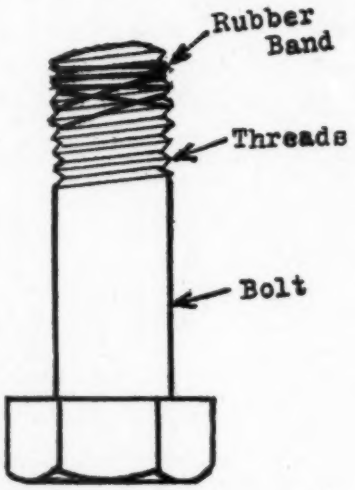
Transmission belting should be frequently inspected so that any accumulation of dirt or other foreign materials on the driving surface or pulleys can be removed, thus increasing the efficiency of power transmission.

Fasteners should always grip belt tightly and should be inspected regularly. Loose fasteners should be promptly tightened and, at the first indication of weakness, should be replaced.—HEWITT-ROBBINS, INC.

How to Lock a Nut With Rubber Band

An ordinary rubber band can be converted into an effective locknut by following the method indicated in the accompanying sketch.

Wrap the rubber band tightly around the threads of the bolt by stretching the rubber while wrapping. (The band being endless will stay in place nicely.) Then turn the nut on.



The rubber band will very likely be "chewed up" by the threads when screwed in place. Usually that will make no difference because the "particles" of rubber remaining between the nut and bolt continue to be elastic even as individual pieces and they will all aid in doing the holding. —W. F. SCHAPHORST.

◆

Grinding Wheel Speed

The speed at which a grinding wheel revolves is important. Too slow a speed means wastage of abrasive without much useful work in return, whereas an excessive speed may result in hard grinding action and may introduce the danger of breakage. As a general proposition, it is better to operate a grinding wheel at somewhere near the speed recommended by the maker, as he has found by years of experience that certain speeds work better than others. The grain, grade, and structure usually recommended for a certain grinding operation are based on the assumption that approximately the recommended speeds will be employed. If for some reason they cannot be, then the grade at least must usually be changed to suit this condition.—NORTON COMPANY

◆

Painting Concrete Surfaces With Organic Paints

It is difficult to secure a good job with organic paints where moisture may enter the concrete from behind. They form impermeable films which may be pushed off by the moisture.

The surface to be painted with organic paints should be carefully prepared. The concrete must be perfectly dry and well seasoned. Oil, grease, and efflorescence should be removed. Old concrete should be wire-brushed or sandblasted lightly to remove dirt and loose particles. New concrete work should be given at least 8 to 10 weeks to dry after the moist curing period before the paint is applied.

When the concrete has dried thoroughly following the curing period, it should be given a neutralizing wash to prevent saponification of the oils. A solution consisting of 2 to 3 lb. zinc sulphate crystals per gal. of water, or a solution containing 2 lb. magnesium fluosilicate per gal. of water may be used. A small amount of pigment may be added to the wash so it will be seen when applied, preventing the skipping of areas. At least 48 hours should be allowed for the solution to dry. When thoroughly dry, all protruding crystals should be removed by brushing. This treatment is not necessary on old concrete or old portland cement stucco.

After the concrete surface is clean and dry, it should be given a binding and suction-killing treatment, consisting of one or more coats of oil or varnish carrying some pigment. A suitable primer may be made by mixing 1 gal. of oil paint, ½ gal. of China wood oil spar varnish and 1 qt. of turpentine or similar thinner. Special priming paints for concrete are also available.

The prime coats should be allowed to dry thoroughly, after which any of the organic paints can be applied in accordance with the manufacturer's directions. PORTLAND CEMENT ASSOCIATION.

◆

Valve Storage Hints

When valves are to be stored before installation, keep them wrapped and protected as shipped from the manufacturer. If they are unprotected and left exposed, sand or other gritty matter may get into the working parts and, if not thoroughly cleaned out, will cause trouble later on. Also store valves so they cannot fall or where other heavy material cannot fall upon them. Great care should always be exercised in handling valves.—THE WM. POWELL CO.

◆

"Carrying" the File

The most natural movement of the hands and arms is to "carry" (stroke) the file across the work in curved lines. This tends toward a rocking motion, and consequently, a convex surface where a level surface is desired.

Figure 1—Right

For the usual flat filing (Figure 1) the operator should aim to carry the file forward on an almost straight line—changing its course enough to prevent "grooving."

Figure 2—Wrong

A very wrong method of carrying the file is shown in Figure 2. Too much pressure is evident; grip is too "desperate"; file isn't held level, motion is curved—"rocking"—and a rounded instead of squared, surface is inevitable.—NICHOLSON FILE COMPANY.

Recommended Wheel Speeds in Surface Feet Per Minute

Tool and cutter grinding	4,500- 6,000
Cylindrical grinding	5,500- 6,500
Internal grinding	2,000- 6,000
Snagging, offhand grinding (vitrified wheels)	5,000- 6,000
Snagging (rubber and Resinold wheels)	7,000- 9,500
Surface grinding	4,000- 6,000
Knife grinding	3,500- 4,500
Hemming cylinders	2,100- 5,000*
Wet tool grinding	5,000- 6,000
Cutlery wheels	4,000- 5,000
Rubber, shellac and Resinoid cutting-off wheels	9,000-16,000*

(*) This higher speed is recommended only where bearings, protection devices and machine rigidity are adequate.

Convention Papers . . . Abridged

The following five abridgments are from papers presented at the joint fall meeting of New York Canadian Div. American Pulp and Paper Mill Superintendents Association and Empire State Section of the Technical Association of the Pulp and Paper Industry, held at Sagamore Hotel, Bolton Landing, Lake George, N. Y., September 12-14, 1946.

Co-operative Research in Wood Products

DR. JOSEPH S. ILLICK, Dean,
New York State College of Forestry

Ever since the establishment of the New York State College of Forestry in 1911, forest research has been among its principal functions and responsibilities.

At first, practically all research work was carried on by the regular teaching staff. Rarely, in the early years of the College, were any staff members assigned specifically and wholly to research work. Research work then consisted largely in the collection and compilation and interpretation of forestry field data for classroom uses, the promotion and improvement of forest operations and practices, and a study of the physical and chemical properties of wood.

In time, an awareness developed for the need of more specialized research in wood products, especially problems arising in the operation and development of wood-using and wood-converting industries.

During the past decade, a series of studies was made by our College of the pulp and paper industry of New York State. The State Department of Commerce also made a comprehensive study and issued a special report on the pulp and paper industry of the State. These studies show a serious and increasing shortage of softwood pulp woods in the State, and a relative abundance of hardwood species that might be suitable for the manufacture of pulp. There was also in evidence a definite economic trend indicating that New York State was bound to lose more and more pulp and paper establishments if an increase of the local supply of pulp wood was not obtained.

During the study of this important problem, the idea was advanced that the situation might be helped by applying newer pulping processes—grinding following pre-treatment and semichemical pulping—to the more abundant hardwood species of the State.

Similar thinking apparently was taking place concurrently by officials and technicians connected with the pulp and paper industries of the State. Then the proposal was made that the College of Forestry and the interested pulp and paper companies join in some form of a co-operative effort in studying this problem. This being a rather new undertaking and having practically no precedents, considerable time was required to explore the feasibility and practicality of this proposal, especially since the College of Forestry is a state institution and operates under definite constitutional and statutory provisions.

After some two years of exploratory efforts, there has been developed what is now generally believed to be an effective initial setup for co-operative industrial research between the College of Forestry and a small group of pulp and paper companies of New York State.

After considerable study of the problem, and upon competent legal advice, it was decided to form a membership corporation pursuant to the Membership Corporations Law of the State of New York. Under date of December 12, 1945, a certificate of incorporation was approved by a Justice of the Supreme Court. This certificate specifies that the name of this new corporation is "Empire State Paper Research Associates, Inc."

On July 1, 1946, the College of Forestry entered into a formal agreement with the Empire State Paper Research Associates, Inc. This is the first major industrial research agreement ever executed by the College of Forestry. Among the principal provisions of this agreement are:

1. That this major industrial research project is known officially as the "Hardwood Pulping Project," and carries the serial number IRP-1.

2. It covers studies in "the mechanical, semi-chemical, and chemical processes of treating hardwoods and certain species of coniferous woods."

3. Its general purpose as set forth in the contract is "to broaden the source of raw material for the pulp and paper industries of New York State, to increase the fiber yield of the papermaking qualities of wood used in the manufacture of pulp and paper, and in general, to help improve the economic condition of the pulp and paper industry."

4. The initial agreement covers two nine-months periods, beginning July 1, 1946, and terminating not later than March 31, 1948, unless covered by a renewal in writing.

5. The work of this project is directed by the administrative staff of the College or by such staff members as may be officially designated by the College. All persons who direct, supervise and otherwise participate in this project at the college laboratories shall be approved by the Dean of the College, and no persons may direct or use the college facilities unless he has official status at the College. The agreement also provides that the College works with the sponsor rather than for him. In no sense is this co-operative research to become or be regarded as an outside college project.

6. The sponsor agrees not to use the name of the College or staff members thereof in advertising, sales promotion work, or in any form of publicity except with written permission of and to the extent approved by the Dean of the College.

7. Manuscripts resulting from this project shall be submitted to the sponsor for its review and suggestions. The College will consider these comments and suggestions, but reserves the right of final decision. All resulting publications will carry a proper acknowledgment of the sponsor co-operation.

8. The College agrees to prepare and submit to the sponsor quarterly technical progress reports.

9. All original records and data will be kept by the College and remain in the custody of the College after the termination of the agreement.

10. It is also agreed that if it is the belief of the College or the Sponsor that any of the methods, processes, machines,

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ATLAS OF AMERICAN PAPERMAKING

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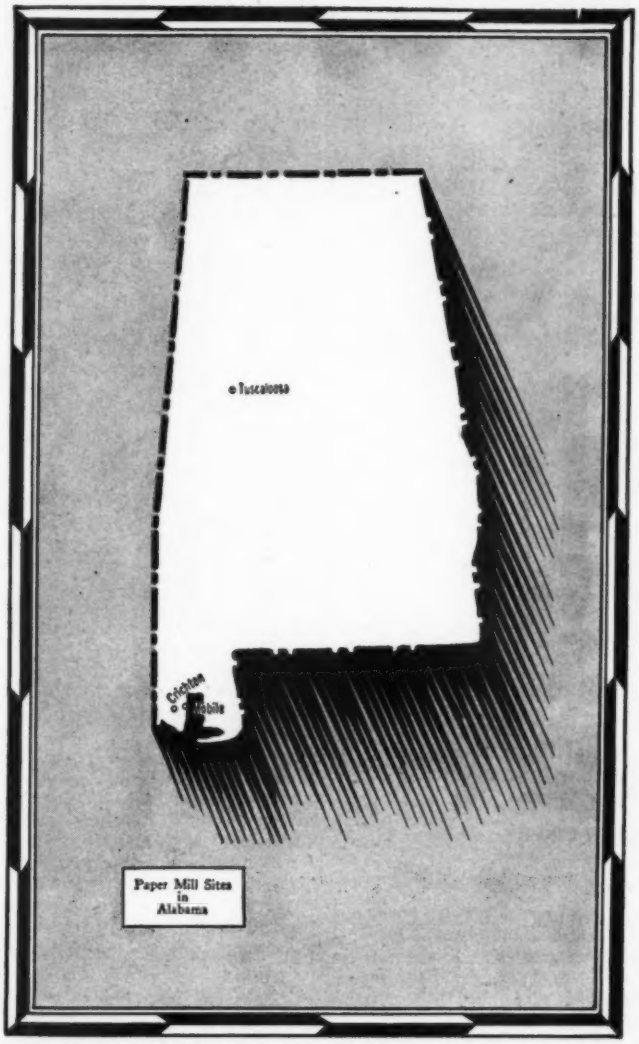

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HIGH LIGHTS:

Alabama is a newcomer among papermaking States. Taking advantage of the native raw materials most, if not all, of the pulp requirements are locally met in self-contained mills.

With one exception the several companies have built large scale mills. One is credited with a daily capacity of 450,000 pounds of sulphate pulp, another with a capacity of 860,000 pounds daily, a third equipped with special machinery for manufacturing wood fibre wallboard, is rated at 200,000 pounds daily of this product, and a fourth plant appears to have a capacity for making 400,000 pounds of kraft paper in 24 hours.

The papermaking equipment includes five Fourdriniers, two Yankees and two wet machines.

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equipment, devices or articles developed as a result of, or in the course of such research are of a patentable nature, that the College of Forestry shall have the right to make application for Letters Patent in the United States and any foreign country, and any patent issued on any such application shall become the property of the College.

Upon the issuance of any such patent by the United States Patent Office, the Sponsor and/or its members shall become vested with the non-exclusive, irrevocable right to practice the method or process, and to manufacture, use and sell the machines, equipment, devices or articles covered by such patent, and the College shall promptly duly execute a formal non-exclusive, irrevocable, fully-paid license to sponsor and/or its members.

In developing this co-operative agreement, several major problems arose. Among these problems were questions regarding patents and publicity. So that these questions could be resolved properly, that is, pursuant to the law of New York State, they were submitted for consideration to the Attorney General of the State and to attorneys for the sponsoring organization. It was found that the College of Forestry, being a state institution and supported entirely by the State, has no right to grant preferential treatment on patent rights, or publication of research results, to any private individuals, agencies or organization. The justification of this point of view becomes all the more apparent when one realizes the nature and extent of the state contributions to this project, namely, more than the combined contributions of all sponsoring agencies.

Under this co-operative agreement the sponsor guarantees to contribute $40,000 toward this project for the period beginning July 1, 1946, and ending March 31, 1947. In order that the funds contributed by the sponsors and the money allocated by the College, may be spent properly and with the full knowledge of all concerned, it is agreed that "annual budgets will be prepared and approved jointly by the College and the Sponsors covering the operations of this project."

Such a budget, approved by the College and the officers of the sponsor of this project, is now in effect covering the nine months period beginning July 1, 1946, and ending March 31, 1947. It provides for a total expenditure of $88,253.50, of which the Empire State Paper Research Associates, Inc. are contributing $40,000 and the College of Forestry $48,253.50. The latter amount includes no charges for depreciation of college buildings and equipment nor for administrative overhead contributions by the College.

The research program now being developed by the College of Forestry is not a detached or separate program. It does not stand apart by itself. Instead, it is an integral part of a large and purposeful research program of the State of New York.

The State Postwar Public Works Planning Commission approved and the last legislature appropriated necessary funds for two new laboratory buildings. One is known as the Paper and Plastics Laboratory and the other as the Wood Products Laboratory. The amount appropriated for these two new buildings is $811,600. Foundation tests were completed recently for these new buildings, which now hold a high priority rating in the state postwar building program.

Considerable new equipment for instruction and research purposes has been added to the College facilities during the past year. More is now in process of acquisition and much more will be needed for necessary future developments. The required needs are especially in the form of new and improved demonstration and research equipment.

A statement on research requirements would not be complete without mentioning the need for more research in the forest itself, which is the source of the raw material used in our mills and factories. Without an adequate and substantial supply of proper wood products, the pulp and paper mills of New York State cannot continue to operate successfully and insure adequate supplies of raw material. More research is needed not only for the development of improved forest operations and practices, but also in the field of forest economics and forest influences.

Anyone in close touch with research knows that there is at present a serious shortage of competent research workers.

This shortage of scientifically trained men must be overcome if an adequate research program is to be developed and maintained, and in no phase of research is this shortage of technical manpower more serious than in the field of wood products. The current need is not only for more research workers, but also for better research workers. In my opinion, our College of Forestry can be helpful to the industries of the State by participating in co-operative research projects, but a far greater and more essential service is the effective training of young men for research work so urgently needed by the wood-using and wood-converting industries.

Economic Conditions of the Pulp and Paper Industry In New York State

M. P. CATHERWOOD, Commissioner of Commerce
State of New York

The pulp and paper industry ranks high among the leading industries of New York State, 12th among all manufacturing industries in 1939, the most recent year for which complete and comparable data are available. But its importance in the State's economy cannot be judged solely by its rank or by the fact that it employs directly almost 20,000 persons and is indirectly responsible for the employment of many thousands more. It differs greatly from the other major industries of this State not only in its technology but also in its economic, social and geographic aspects. The industry is, to a large degree, a rural industry. Very little of the paper made in the State is produced in the Metropolitan Area and most of the upstate mills are located outside cities, in villages or in unincorporated areas. The economic life of many communities in northern New York is built entirely around the paper industry. In such communities there is very little in the way of alternative possibilities of employment and the closing of a paper mill is a major catastrophy not only for the mill employees but for the merchants, professional men and all others who draw their customers and clients from among the mill workers. Because this industry occupies such a vital place in such a large section of our State, we in the State Department of Commerce consider it of special importance and are greatly concerned with its prosperity.

It is true that New York still maintains its position as the leading producer of paper and paperboard in the country and that its production in 1945 was higher than during prewar years, exceeded only by the peak war years of 1941 and 1942. If, however, we compare New York's record with that of the rest of the country, we find that production in the country as a whole has been increasing steadily while that in New York State has remained relatively stable. In 1925, New York produced 16.4 per cent of all paper manufactured in the United States. By 1940, this percentage had fallen to 10.1 and by 1945 to 8.9. In the production of wood pulp, New York has declined in terms of tonnage produced as well as in its relative position in the Nation. Prior to 1916, New York was the leading pulp producing State, but has now fallen to sixth place. A decline of almost 40 per cent, in terms of quantity of pulp produced, has been recorded since 1920.

As the Nation's paper and pulp industry expanded—and its growth has been remarkably steady—new mills have been built elsewhere and many of the older New York mills, unable to compete with newer and more efficient mills, have closed. Between 1917 and 1940, only 21 new mills were erected in this State, while 69 ceased operations. In addition to the mills which went out of business completely, 17 of the integrated establishments dismantled their pulp mills. It should be pointed out, however, that many of the remaining establishments modernized their equipment and during this period, paper producing capacity increased by almost 30 per cent. Pulp capacity on the other hand, declined by about 31 per cent. Even during the recent war when demand for paper reached new high levels some additional mills were closed.

In 1942, the Department of Commerce conducted and published a study of the pulp and paper industry of the State and found that the principle cause of the relative decline of the industry in New York State was the depletion of pulpwood resources available to the industry and the consequent high cost of pulpwood to pulp mills and of wood pulp to paper mills. Extensive investigation disclosed no conclusive evidence that other items of cost were generally higher in New York than in competing states.

During the war, New York State mills found themselves in an extremely serious situation as far as their raw material supplies were concerned. The European sour-

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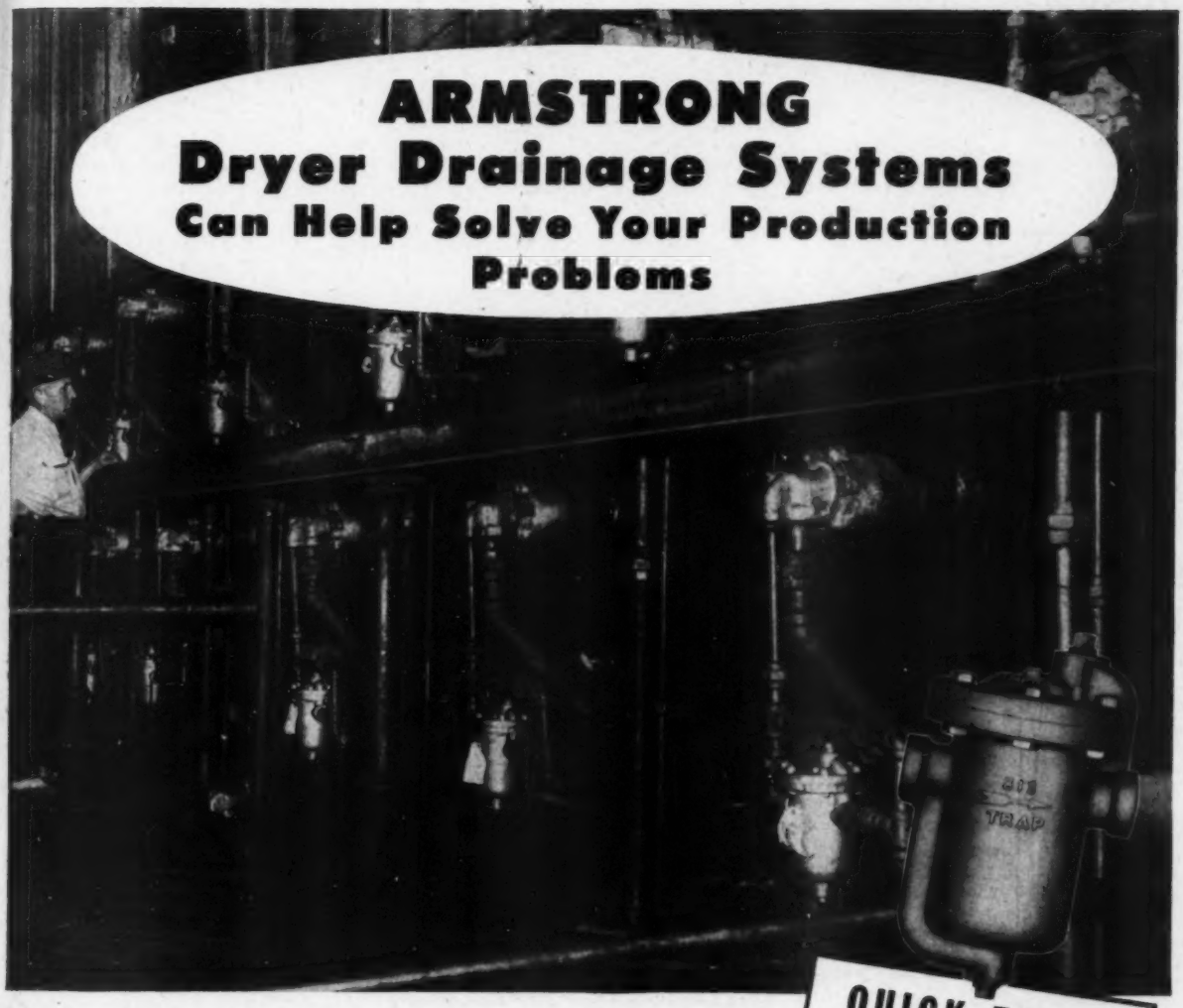

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ces, upon which many mills had been depending, were cut off completely and the shortage of forest labor in both the United States and Canada made difficult any increase in the supply of either pulpwood or wood pulp available on this continent. If it had not been for governmental allocation of available pulp supplies, many additional New York paper mills would have been forced to close.

The extent to which New York mills have been dependent upon outside sources for their raw materials is indicated by the fact that in 1939 only 16 per cent of the wood which eventually found its way into paper produced in the State was grown here. 28 per cent was grown outside the State, but manufactured into pulp in New York, while 56 per cent was both grown and converted into pulp elsewhere.

Knowing that New York's pulp and paper industry is in a vulnerable condition, and knowing the principle cause of its present condition, the next and obvious step is to consider what, if anything, can be done to improve the situation. For long run improvement of the industry as a whole, it is essential that the cost of raw materials be reduced and this can only be done by increasing the volume available from nearby sources. Some mills in the State have shown that proper management of forest lands pays dividends and there are other forest owners who could profit by the example set. The State's reforestation program eventually will increase available raw materials for the pulp industry and for other wood-using industries. It must be recognized, however, that the vast stretches of State-owned forest land included in the Adirondack and the Catskill Parks are not available for commercial uses under the present State constitutional provisions. Another avenue opening up is the use, by pulp mills, of species formerly considered unsuitable for pulp manufacture. It is my understanding that some of these less expensive woods are now being used by progressive mills in the state and experiments are being conducted which should eventually result in making possible the more extensive use of such woods. Another avenue open, worthy of serious consideration, is the increased use of waste paper as a raw material. In New York City this State has the largest single concentrated source of this raw material in the world.

I am struck by the fact that relatively few of New York mills are found in the lower Hudson Valley and that most of the waste paper originating in New York City is used by mills in neighboring states. It appears to me that the southern part of our State offers excellent locations for mills producing paperboard or other types of paper from waste paper, and I would welcome an opportunity for the New York State Department of Commerce to investigate this possibility with any paper producer interested in expanding his facilities in these grades.

There are numerous examples of mills which have overcome the disadvantages of high raw material costs and are operating at a profit. By utilizing their manufacturing skills, they have produced high quality papers and through aggressive merchandising have developed markets for these papers. There certainly must be other mills for which future prospects are not bright but which could find their salvation in this manner.

The paper and pulp industry in New York needs to be especially apprehensive of the prospects of a slump in the future. During past depressions production in this state has fallen at a greater rate than in the rest of the country. At such times, when competition becomes keener, the older mills are at a greater disadvantage than during prosperous periods. If anything can be done to strengthen the economic structure of the industry—and I believe something can be done—now is the time to do it, not when the problem becomes acute.

Industrial Relations

E. G. AMOS, Secretary, Industrial Relations Committee
American Paper and Pulp Association

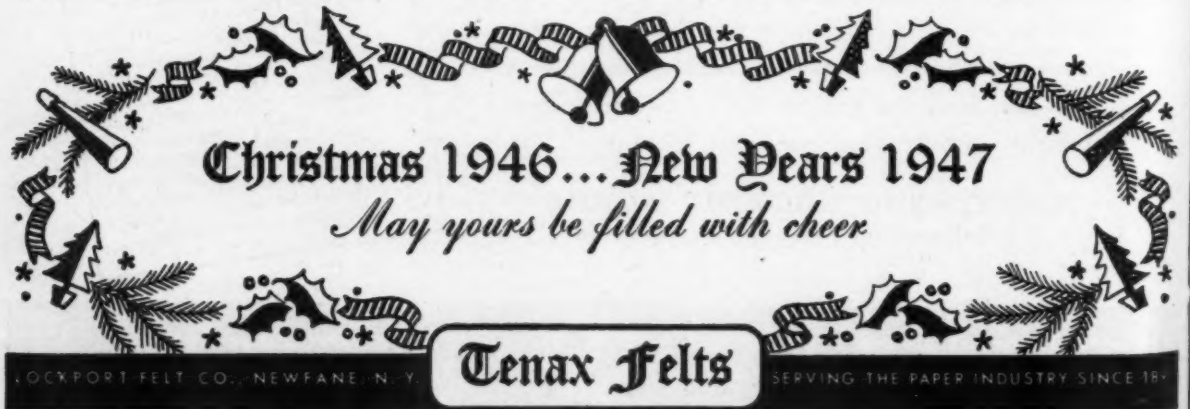
To fully appreciate the problems, let me first give you a little background of what we face today from the standpoint of labor organization. Probably 80 per cent of the primary pulp and paper mills in this country are organized by one of the four National or International Unions. Not many years ago, we had to deal with only two—the A. F. of L. craft unions, and since they grew up in the same family, there was little, if any, jurisdictional disputes or squabbles as to who was going to organize certain mills. They spoke the same language, and still do for that matter.

However, now with the C. I. O. and District 50 (catch-all union for U.M.W.) we find quite a different picture. These two unions have around 50 paper mills, approximately 25 each, organized, and both have apparently set out to organize the paper industry, a field long held with no competition by the A. F. of L. craft unions. No longer are these craft unions able to sit back and feel they can rest on their oars and organize new mills when the spirit so moves. On the other hand, they are pushed to the limit to retain the mills they already have organized, let alone getting new ones. District 50 captured one of the largest mills in the United States from the A. F. of L., and the C.I.O. has taken probably a half-dozen where the Brotherhood had felt firmly entrenched. What the relationship of District 50 will be to the A. F. of L. in the future, still brings up some questions.

Industry-wide, we have been fortunate in the matter of strikes. To be sure we have had a few, but compared to other large industries, such as coal, steel or automobiles, we have been harried but little. This is due, we think, to several reasons, among which are steady employment over a period of years, no reconversion problems, good wages and working conditions, and a widespread desire amongst the employees not to enter into costly strikes. Widespread accurate information would avert many tense situations, and this applies to everyone concerned. So often, matters drag on to the point where a fairly simple grievance or misunderstanding leads to dire ends.

Labor costs have risen in this industry since 1941 over 50 per cent, with the paper production for man-hours, remaining about the same. This, coupled with increasing costs for raw materials such as pulp, presents a problem that only increased production or higher selling prices can solve.

It is quite evident that there must be a complete and thorough understanding of company policy, from top management on down to each and every worker in the plant. In a lot of plants, company policy is recorded only in the Union Agreement,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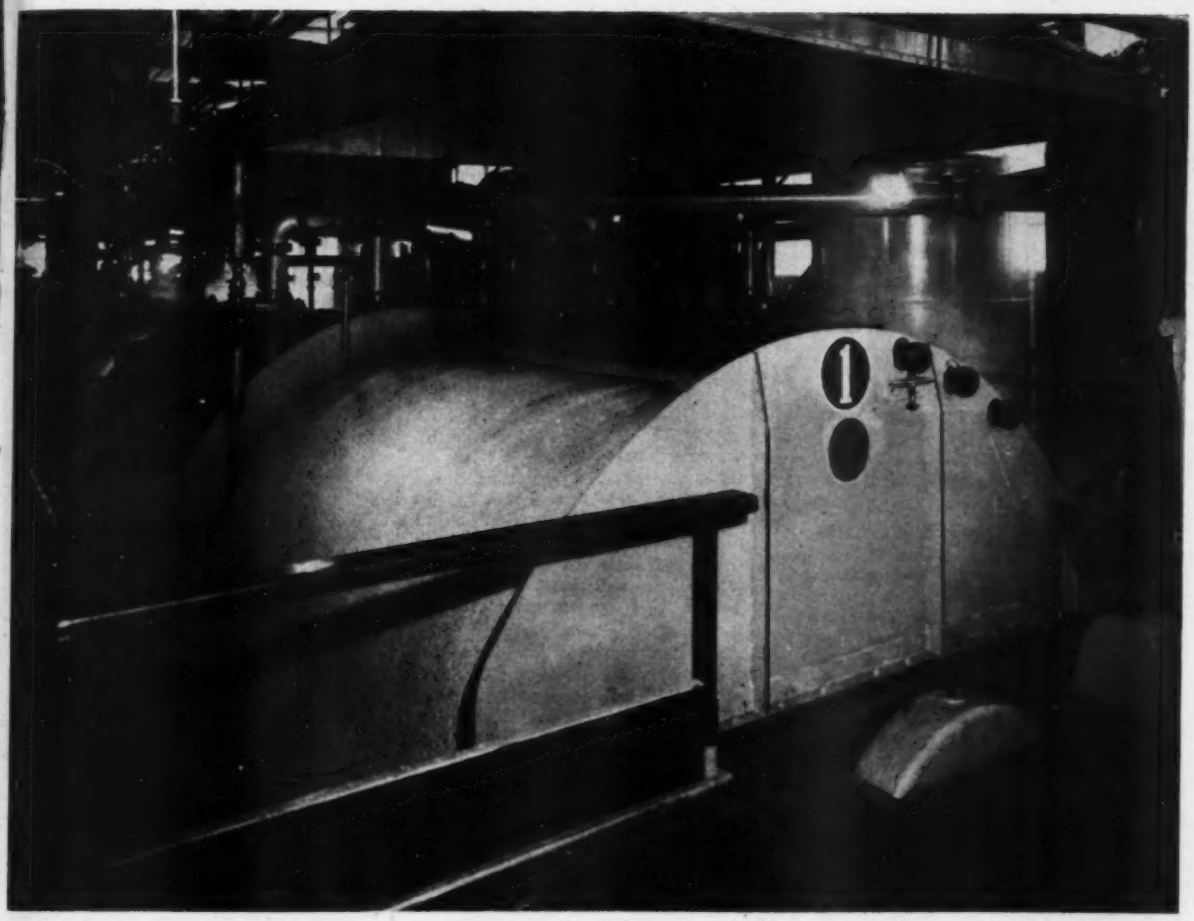

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and too many times, this agreement or contract, call it what you will, is drawn by the personnel department or the top executives of the plant, without prior discussion with those who will shortly be called upon to administer those policies or provisions.

So the first step must be one of close co-operation and understanding of issues involved, when a union contract is in the making, or, in case of no union when policies are being developed. The progressive mill manager or personnel manager, will discuss the proposed policies with supervisory groups and explain precisely what is involved, and ask for and accept suggestions. The supervisory group is then in a position to explain its polices and what they mean to the group of workers, with the result that every employee in the mill will understand company policy as reflected with union contract.

The supervisor, who is usually the first step in the grievance procedure as outlined in the union agreement, is in a very poor position if he does not understand his company's policies. He is indeed in a poor postion if he does not know immedately, how certain grievances were settled in other departments of the plant. A perfect liaison must be maintained in matters affecting employee relations, and decisions pertaining to grievance settlement cannot wait until a month or even next week before they are made known to all concerned.

One of the most pressing causes for grievance is wages. Why were wages set as they are for any given job in a plant? Were they worked by job analysis and then, were they paid accordingly? If so, what factors influenced the personnel department or job analyst to arrive where he did in making up the wage structure? If no plan was followed, what did set the price, and does the supervisor know why the occupational rate is where it now stands?

Unless he does know and can explain it to the employee, he is not in too good a position to settle any dispute at the level of the first step in the grievance procedure.

What is the company's promotion policy, if any? Here again, the live supervisor is liable to find himself in a rather embarrassing position unless he is familiar with all the opportunities ahead for all the employees under him, and proceeds to explain what they are and what training is needed to qualify for promotion and what facilities are available to attain this training. He is then in a postion to aid employees who are ambitious, or, create ambition in their desire to get ahead.

Usually, in the larger mills at least, the hiring and placement is done by the personnel department, and too often the supervisor has little to say about the man sent him to fill a particular job. This all important matter of placement can only be solved by the closest co-operation and understanding between personnel and supervisors. Poor placement means poor labor, turnover and high costs.

From a survey we currently have in progress, wherein we attempt to keep the industry advised of current changes in wage rates, we find it necessary to send out numerous changes each week. There are 198 mills co-operating in this wage information service, and a recent tabulation brought out some interesting facts. At that time, we had all the information on 192 mills, and this showed that 109 of these mills have reverted to a 40-hour week and have raised their hourly rates .155c per hour since V-J Day. The 83 mills still on the 48-hour work week showed an average increase of .125c per hour since V-J Day. These raises ranged all the way from 0 (six mills reported no raise since V-J Day) to 25c. One reported 30c but the reason for this was a discontinuance of a profit-sharing bonus plan that had been in effect over a period of years, and was stopped at the union's request, and a raise substituted.

Out of the 192 mills reporting, there were 29 mills or 15 per cent that had no union; 31 mills or 16 per cent had a voluntary checkoff, and 12 mills or 6 per cent had a mandatory checkoff; while 120 mills or 62 per cent, that had a union, did not check off dues in any manner.

The matter of premium pay for Sunday, was also reported. We found 95 mills, or 49.9 per cent, out of the 192, paid time and a half for Sunday as such; 49 mills or 25.5 per cent paid double time for Sunday as such, and 23 per cent or 45 mills, did not pay any premium for Sunday, just because it was Sunday.

Contributions of the Forest To the Pulp and Paper Industry

"A Look Ahead"

PROFESSOR NELSON C. BROWN
New York State College of Forestry

For some 46 years, various government experts and perhaps near-experts, have been warning the American public of an impending timber famine that has been "just around the corner." We have been watching that "corner" for many years. It is my personal belief that, in spite of expanding future requirements for wood, principally lumber, pulp and paper and many others, we can take care of this problem. If it is to be done, it will be accomplished by private initiative and enterprise with state and federal co-operation.

It has been conclusively demonstrated that pulpwood can be grown in the South in some cases in from 12 to 15 years, or more. Timber grows in the Northeast much more slowly. Spruce is an exceedingly slow-growing tree. The four southern pines are generally rapid-growing except on unfavorable locations. Douglas fir and Western hemlock and some other woods are also rapid growers, in a region exceptionally favorable to tree growth.

The big objective ahead, in forestry, is to grow and efficiently utilize more timber. There will likely be a very strong demand for any and all kinds of wood that can be grown.

Our forests will be regenerated, largely, by natural means, not by planting. Most of our various areas are fortunately blessed by favorable soils and adequate precipitation, which are the keynotes of successful forest growth.

Pulpwood consumption in the United States is about 16,400,000 cords. In 1947, it is estimated that there may be over 17,000,000 cords used. Perhaps in 1947 to 1950, the figure may be between 18 and 20 million cords, or more per year. That is something to which the industry must give serious consideration.

The average natural growth of our forests for pulpwood purposes, is exceedingly slow, perhaps 1/8 to 1/4 cord per year in the Northeast. Growth is more rapid in the South and may average 1/2 cord per acre per year. There are many tracts in the Northeast that grow at the rate of 1/4 cord per acre per annum, but this is not an average figure. Virgin forests do not grow in volume, because growth is offset by decay. Therefore, large regions like the Adirondacks under state control, are unproductive and useless as far as industry is concerned.

For the past thirty years I have consulted with the operating managers of some pulp and paper companies which own forests as a back log to protect their capital investments by insuring a permanent and adequate source of raw material for their paper and paper products.

Some of their viewpoints may be summarized as follows:

1. The rate of growth of pulpwood in the Northeast and Eastern Canada is generally between 1/4 and 1/2 cord per acre per year for the better stands. Under poor soil or site conditions, the growth is still lower. Many companies do not feel that forests can be grown as a sound financial program when growth is as slow as this unless higher prices for wood prevail. In the South, under average conditions, the companies can count on a growth of about 1/2 cord per acre per year. Growing timber at 1/2 cord per acre per year can be continued as a sound financial venture. Under the Canadian system, the Government has a big stake in the protection and management of the spruce forests.

2. Under proper and skillful methods of forest management, the rate of growth, especially in immature stands in the Northeast, can be materially increased even if such management may increase the cost of operating, which, along with high taxes, interest on investments, scarcity and inefficiency of labor, may cause some of the companies to vary their opinions regarding the profitability of large timberland investments for the future.

3. The large companies generally believe that only under exceptionally favorable circumstances is planting trees profitable. If at low cost, land can be acquired, and the site is unusually favorable for growing trees and enjoys a location accessible to a permanent pulp mill, planting may be profitable. Many large companies have already engaged in very extensive reforestation operations, some of them running into hundreds of thousands of trees. Some of these plantations were made as long ago as 30 years or more. We still have much to learn as to how best to manage these stands and how profitable they will be. Reforestation must be carried on by State, Federal, County and

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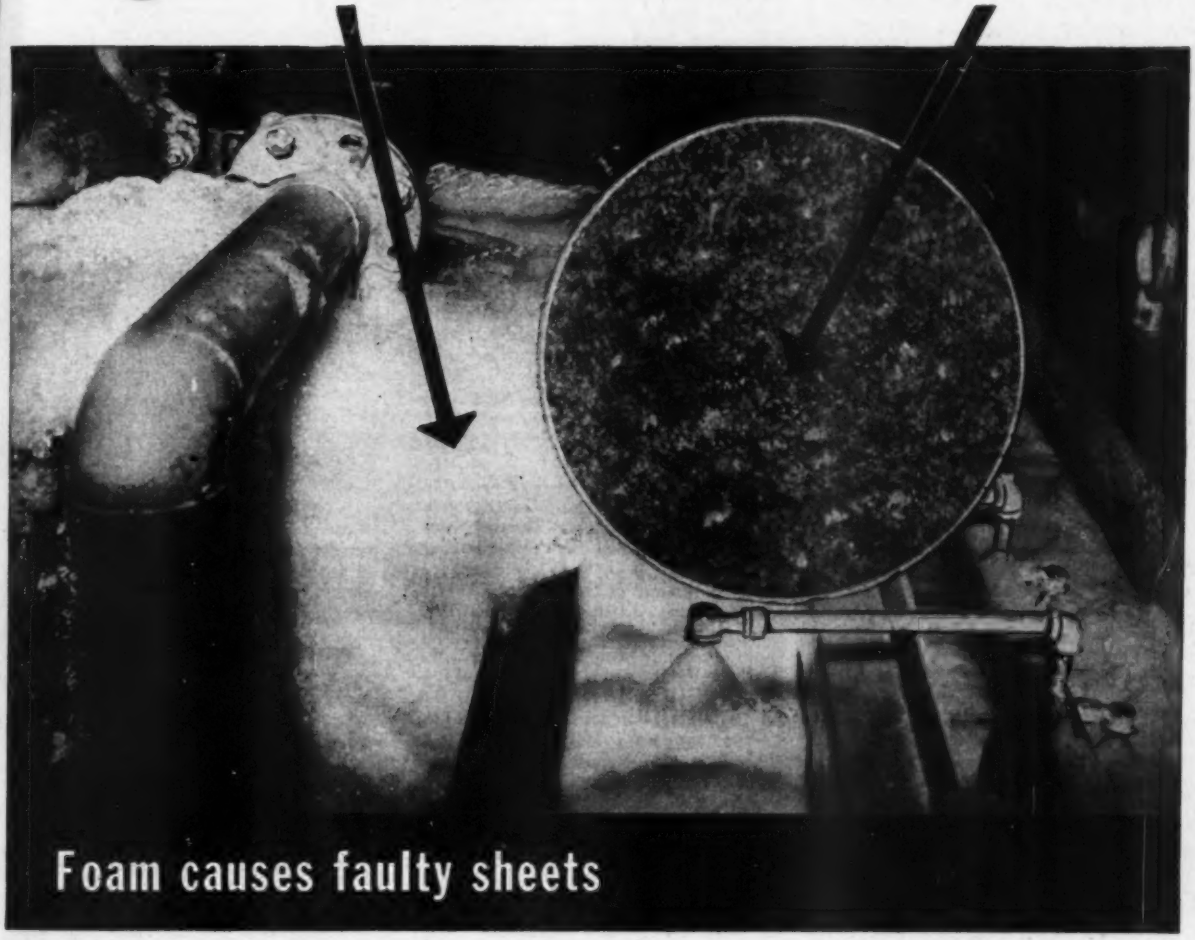

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other local governments. Because of continuity of ownership and program and the wide public benefits to be derived from reforestation, these public agencies are in a better position to engage in these activities than are private enterprises.

There are about 4,000,000 acres of idle and abandoned farm lands in New York that should be growing timber. There are said to be 10,000,000 acres of such land in New England and perhaps 50,000,000 acres East of the Mississippi River. Some of this land is being acquired for State, national and community forests and planted with trees. This program should be expanded and encouraged.

There are 460 million acres of commercial forest lands in the United States. Of this, 340 million acres or 74 per cent are privately owned and 120 million acres are in public ownership.

Let's take a look at the ownership of this private land. A large share, namely, about 140 million acres, are owned by 3,475,000 farmers and about 133 million acres are owned by 528,000 non-farmer owners. In other words, this timber is widely scattered among relatively small woodlots and forests principally in the Northeast, the South and Lake States. Timber owned by industrial owners amounts to only 60 million acres. Among these are large lumber companies, pulp and paper companies, and a wide variety of industries such as the Eastman Kodak, Singer Sewing Machine, U. S. Steel Corporation, the Railroads, cooperage, veneer and many other industries interested in the forest as a source of raw material.

The significance of these statistics is that we must look more and more to the small woodland owner for a future supply of pulpwood. He should be encouraged to grow timber. Many farmers have already shown a higher percentage return on the capital invested in timber than in some other farm crops. This has already been indicated in some states such as Maine and Vermont.

In the conversion of saw logs into lumber, about as much wood is lost in the form of sawdust, slabs, edgings, trimmings, etc., as is recovered in the form of boards, planks and timbers. Already several hundred thousand cords of this waste material are used annually for fiber boards, plastics, and various forms of paper, especially in the Pacific Northwest. But an equivalent volume of about 30 billion board feet or 1,500,000 carloads are wasted yearly or burned as fuel. This is a great potential field for research.

Organization and Function of Empire State Paper Research Associates, Inc.

ARNO W. NICKERSON

About two years ago, several alert pulp and paper manufacturers in New York state became conscious of the dwindling supplies of coniferous woods within the state to supply the large mechanical and chemical pulp mills, and at an informal meeting, discussed the advisability of exploring sources of new fiber for the industry. The most logical source of importance within the state are the deciduous woods. After several meetings and an equal number of false starts and with changing interest on the part of the smaller mills, a group was finally organized consisting of about a dozen mills. The organization known as the EMPIRE STATE PAPER RESEARCH ASSOCIATES, INC., was formed as a non-profit group. The excellent facilities at the New York State College of Forestry were thoroughly explored and several conferences held with the Dean and the other professors in charge who expressed enthusiastic interest in this project.

The officers of the Association are: Harry M. Gray, President, Oswego Falls Corp.; S. S. Stevens, Vice President, Berst-Forster Dixfield Co.; F. C. Goodwill, Secretary and Treasurer, St. Regis Paper Company. Subscriptions to the project were invited on a definite schedule of tonnage of pulp, or pulp and paper produced. The response has, indeed, been most satisfactory.

The State of New York Conservation Department published, in 1944, a comprehensive report on a survey of forest resources and timber cutting within the state. The forest area of the state is over 11 million acres, of which 8½ are privately owned. The merchantable timber amounts to 13 billion board feet with 8 billion privately owned. The pulpwood stand is 16 million cords. Annual cutting is estimated at 27,400,000 board feet of lumber and 200,000 cords of pulp wood from 115,000 acres. The total annual forest products removed from the state each year is 3.3 million cords of wood. Against this cut is an estimated annual growth of 1.8 million cords. This indicates that the "take" is about twice the rate of the growth.

The Department further estimates that there are nearly 12 million cords of deciduous wood suitable for pulp. About 8 million cords of this wood are accessible either by existing roads or made accessible by roads which can be built at nominal cost.

Maine, New Hampshire and Vermont possess large stands of hardwoods, most of it privately owned.

A further report was published on the Conference on New Developments in wood Products at Syracuse University in 1944 in which the following significant statements were made:

"Use of Hardwoods for Paper Manufacture."

The gradual exhaustion of the coniferous pulpwood resources of parts of the country—a situation becoming particularly serious in the Northeastern States—has focused attention on possible substitutes for these coniferous woods. During the past year, a large amount of research has been undertaken by several leading manufacturers in the paper industry to supplement knowledge and experience as to the suitability of the hardwoods for paper manufacture. The results of many of these studies are unusually promising and it is reported that several large scale projects will be initiated immediately after the war to rebuild and convert existing mills to the manufacture of both mechanical and chemical pulps from these hardwoods.

This development should be of particular interest to the paper industry in New York, which manufactures more paper products than any other state in the nation, but where a serious shortage exists in the supply of coniferous pulpwood.

The New York State College of Forestry initiated limited studies more than ten years ago concerning the possibilities of utilizing the New York state hardwoods in the manufacture of pulp and paper. Recently this work on the pulping of hardwoods has been intensified through the financial support of out-of-state mills who are interested in utilizing the native hardwoods of their own states and who have formulated post-

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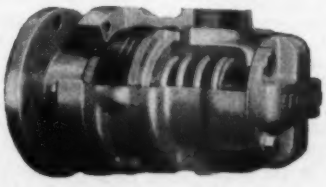

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war plans for manufacturing and merchandising the products in which these hardwood pulps will be used.

While high quality chemical pulps, suitable for dissolving purposes and paper uses, can and are being manufactured from the hardwoods in appreciable tonnages, the most promising new methods for pulping these woods seem to be the application of short, mild chemical cooks to the chipped wood, followed by passage of the treated chips through an attrition mill to finally resolve the chip structure into individual fibers. Processed in this manner certain hardwoods give strong, clean pulps with yield up to 75 per cent and which may be bleached to a satisfactory color with either chlorine or peroxide. Hardwood pulps of even greater potential value may be obtained by treating wood blocks with either acid or alkaline liquors of low chemical concentration, and then grinding to produce a mechanical pulp of excellent papermaking characteristics. A series of investigations carried out in the pulp and paper laboratories of this institution have proved that various hardwoods treated in this manner, can be ground at the high production rate of approximately two tons per square foot of stone surface per day in comparison with spruce which grinds at the rate of about one ton per square foot per day. This high production rate is obtained at a very low power consumption, this being in the neighborhood of 25 hp. days per ton in comparison with spruce which requires 50 hp. days per ton. Some of the pulps produced in this manner have exhibited strength values nearly equal to those of spruce groundwood pulps, and bulking values even higher than most spruce pulps. The yield of pulp per cord of hardwood is, of course, considerably higher than that obtained from spruce due to the fact that the air dry weight of the hardwoods is 34 to 44 pounds per cubic foot in comparison with the spruce at 23 to 29 pounds per cubic foot. It seems possible that the many factors which are favorable to the production of this type of mechanical pulp may completely offset the cost of the chemical pre-treatment.

The technical program now already under way in connection with the ESPRA project will include first, application of the most modern technology as applied to grinding of hardwoods including, pre-impregnation and subsequent refining by attrition machines, all on a semi-commercial scale. The equipment at New York State College of Forestry is most excellent for this purpose since the laboratory possesses digesters large enough to handle over 1000 lb. of chips, commercial size grinders, screens and all complimentary equipment, refining and beating equipment as well as a paper machine with both a fourdrinier and cylinder wet end.

Since soft woods reduced by the mechanical process produce large percentages of very short fibers, this writer believes that by grinding hardwoods coarser and rejecting the extra long fibers by screening, then refining the tailings we have an opportunity to make hardwood fibers nearly comparable to present softwood mechanical pulp.

The most modern technology will also be applied to semi-chemical pulping of hardwood in an effort to secure better strength values, higher yield, better color and lower processing cost.

Several out-of-state mills have joined in the work of ESPRA and we welcome others who may be interested.

This program, therefore, seems to present the most logical and comprehensive effort on the part of the papermakers to help the industry by opening up new fiber sources to supplement the fast dwindling supplies of softwoods and to make this fiber source useful to users of cellulose in all forms.

Abridgments in this section are from papers presented at the fall meeting of ***The Technical Association of the Pulp and Paper Industry*** held in Detroit, Mich., September 26-28, 1946.

New Developments Relating To Improved Pulpwood Procurement in the South

G. E. KNAPP, Logging Engineer
Southern Pulpwood Conservation Association

Last year the South produced roughly 7 million cords of pulpwood, approximately 50 per cent of the production in the United States.

Wood is procured under three general systems: (1) dealer—producer; (2) mill representative—producer; and (3) company logging operations.

Most widely used, particularly by the larger mills, is the dealer-producer system, wherein the dealer contracts with the mill to ship an agreed volume of wood from his specified and protected territory. His territory may vary in size from one to several counties. It is the dealer's responsibility to organize wood production in his territory. This includes financial aid to his producers in purchasing stumpage and logging equipment. The mills frequently maintain field expeditors who keep in contact with the dealers.

The mill representative—producer system is similar in that the mills place resident supervisors in an area covering several counties. It is their function to develop wood production by contact with the woodland owner and producer. Many of the smaller mills employ this system.

The third major procurement system deals with the complete purchase and logging by mill payroll personnel. Until the past year or two, scarcely any wood was produced in this manner. However, the increased demand for wood, the need to log wood from less favorable chances, the advantages of company crews logging fee lands, and interfering governmental regulations and restrictions have prompted several pulp companies to implement their purchased wood procurement with company operations.

At least one company is establishing small permanent crews on fee-owned tracts to do forest protection work. In slack periods they do improvement thinning and salvage cutting as an aid to production, but maintain no set wood production schedule.

As a means to stabilizing forest communities one large company is working toward establishing sustained cutting operations on fee-owned blocks of 20,000 acres and larger. It is estimated that the harvesting of the equivalent of an annual increment of ½ to 1 cord per acre per year will provide steady employment for 50 to 75 families.

Company operations are, in nearly all cases, equipped to some degree with mechanized logging machinery. As such, they are the proving grounds for improved methods and machinery to produce pulpwood. In addition, they are training bases for supervisory personnel and woods labor who will carry on other pulpwood producing operations using up-to-date systems—whether they be company or independent producer operations.

A service relatively new and relating to procurement is being offered to landowners by the pulpwood industry in the South. Member mills of the Southern Pulpwood Conservation Association, a group representing 85 per cent of southern production, for which I can speak authoritatively, will supply forestry timber marking service on non-company lands. In this manner, trees needing removal from the stand are turned into pulpwood and other forest products, while at the same time leaving the stand in the best possible growing condition to provide future wood supplies.

Prior to the war, labor—largely negro—was readily available at low wage rates. Pulpwood was cut with cross-cut saws, and loaded on the truck manually. Machines had little chance to compete, based on cost of production.

Today, although most pulpwood is still loaded by hand, the situation has changed. Available labor is scarce and its efficiency has decreased. Wages of woods labor have reached at least 60 cents per hour. Producers are faced with the need to increase man-hour production to keep down operating costs, and have turned to mechanization.

Foremost in mechanical development are the portable power saws. The bicycle wheel-type circular saw, powered by a 3½ to 6 horsepower air-cooled engine, is particularly adaptable to conditions of the southern flatwoods. Level topography with fairly open forest floor permits the operator to push the saw around from tree to tree. This wheel-type saw is used both for timber felling and bucking. Conservative estimates indicate that between 5,000 and 6,000 units are in use in pulpwood production.

In this region, the wheel-type power saw has proven its ability to increase production over the conventional cross-cut saw. One man operating a unit can fell 150 to 400 trees per day, a task that would normally require 4 men with hand tools.

Portable power chain saws were introduced in the southern region less than five years ago. Their use has been limited primarily to sawlog and veneer operations. Recent introduction, however, of the bow-type blades for the one and two man saws shows considerable promise for use in

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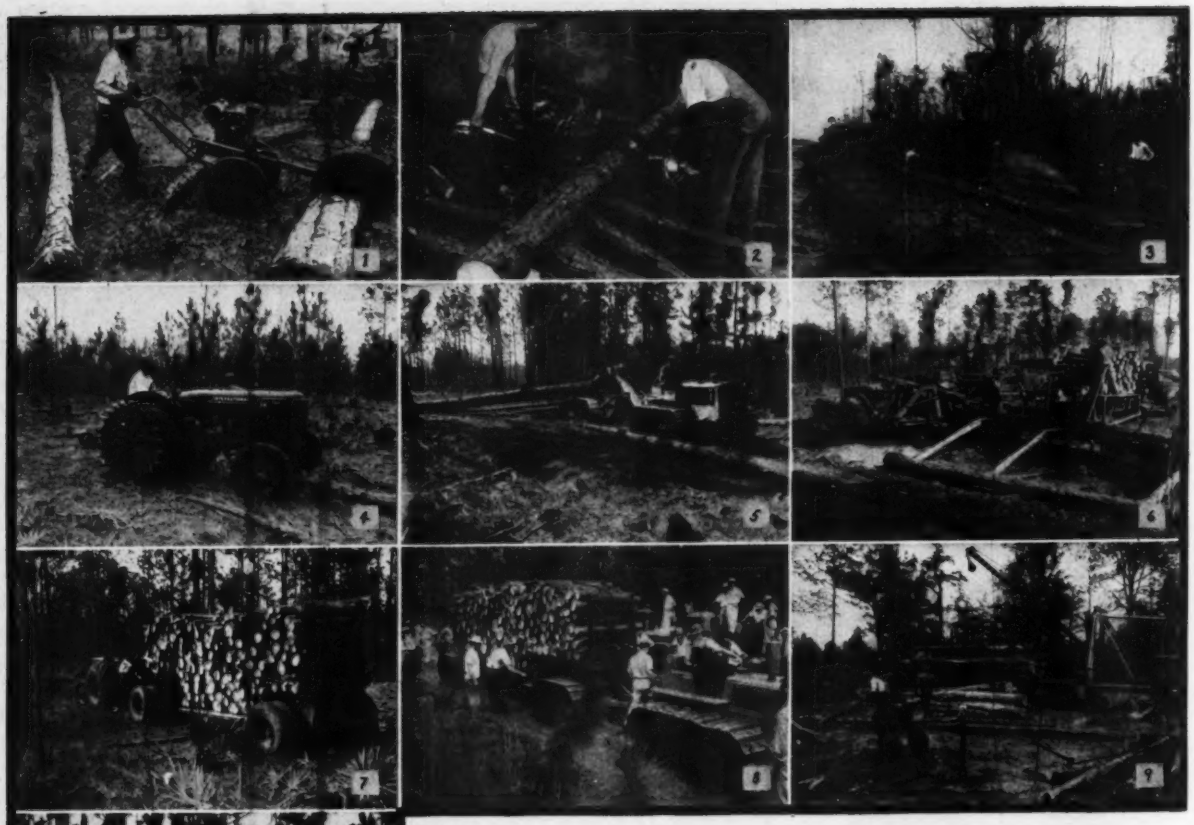

FIG. 1—This mechanical wheel-type circular power saw is widely used in southern pulpwood operations. It also is used effectively for tree felling in the coastal flatwoods. . . . FIG. 2—A two-man power chain saw equipped with a bow type guide blade to minimize pinching in the cut. . . . FIG. 3—Tree length logs are skidded to the deck by tractor, bucked into pulpwood lengths by power saw, but loaded onto the truck by hand. . . . FIG. 4—Although limited to firm ground and small tree skidding capacities, the wheel tractor appeals to the small pulpwood producer because of its low initial cost and easy maintenance. . . . FIG. 5—The crawler tractor, with its auxiliary winch and arch accessories, is expected to increase the recovery of timber from sites heretofore inaccessible. . . . FIG. 6—This portable pulpwood mill is designed to process tree length logs into pulpwood bolts conveyed onto the truck. It can produce as much as 80 cords per day. . . . FIG. 7—A simple, rugged trailer carrying 4 cords of pulpwood is towed by an industrial tractor capable of a speed up to 23 mph. This combination is used from woods direct to rail siding for distances not over 10 miles. . . . FIG. 8—A 6½-cord semitrailer load of pulpwood was towed out of a boggy area on crawler tracks. The loaded frame is being placed on its four stiff legs as the front crawler dolly is replaced by a truck tractor and the rear crawler assembly for travel on the highway. "Milk runs" in pulpwood hauling may result if the farmer may load pulpwood on trailer frame parked in his yard. . . . FIG. 9—A combination log-length pulpwood and sawlog operation with tractors skidding tree lengths, portable circular power saw bucking 16-ft. logs, and loading on log truck and trailer. . . . FIG. 10—The military three-axle truck with its increased traction and flotation approaches the type of commercial truck which is needed to haul pulpwood and other forest products.

pulpwood operations. The bow-type blade is designed to eliminate pinching when cutting small sizes of logs, a hindrance which heretofore has limited the application of the chain saw.

Generally speaking, the introduction of the power saw has just about doubled the man-hour production in pulpwood cutting. It is stated by one mill executive that the portable power saws during the war were largely responsible for maintaining the South's pulpwood production, in fact, increasing it by a million cords.

Further mechanization is entering into southern operations in the form of tractors, arches, and skidders to bunch tree-length logs to central decks where portable mills slash the logs into pulpwood belts and convey them onto a truck for transportation to rail siding or direct to the pulp mill.

Wood that is bucked into pulpwood belts where the tree falls has to be loaded by hand since no practical mechanical means has been devised to handle individual scattered sticks. The alternative, then, has been to employ tractors, both wheel and crawler type, to skid tree length logs to a concentration deck where mechanical means can be used to load the wood. The wheel tractor is considerably limited in the volume it can skid, and the ground conditions over which it can operate. However, its relatively low initial cost and its convenience to local repair service makes it a popular and practical unit for the small producer. Crawler tractors with such auxiliary equipment, as winches and arches, are receiving much wider application in pulpwood operations than ever before. Their use is permitting us to tap supplies of pulpwood in strands and bottoms which heretofore have been considered inaccessible.

The bunching of logs to a central deck in the woods permits handling of the wood by any of several methods. At present, it is common practice to slash the logs into pulpwood bolts on the deck with portable power saws. Wood cut in this manner is usually loaded on the truck by hand. However, a few producers are using portable power driven elevating conveyors on which the bolts are placed manually. Others are experimenting with the handling of wood in bundles.

A more highly mechanized operation is gaining favor among southern producers. It involves the operation of a portable pulpwood mill, which conveys the log through a cut-off saw and elevates

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the pulpwood bolt onto the truck. Using power machinery for felling and bunching logs, such a mechanized operation represents a total investment of 12,000 to 15,000 dollars and possibly an 18-man crew. Production schedules attained thus far range from 25 to 50 cords per day from stump to freight car or barge. This represents a man-day production of 2 to 2½ cords, which is considered well above hand production rates.

A small quantity of pulpwood is being hauled in log-lengths to slasher mills at the railroad siding or directly to the pulp mill. In the past five years, a few of the pulp mills have installed multiple saw slashers in their wood yards to process log-length wood delivered by rail or log truck.

Cost of producing wood in log-lengths has yet to be proven more economical than conventional operations. One bottleneck lies in the difficulty of loading small diameter logs at a rate fast enough to be economical. Also, the rail freight structure, as it stands today, is unfavorable to shipping pulpwood in other than short lengths.

Every stick of southern pulpwood travels some portion of its route from stump to mill on rubber. Usually, it is hauled to the rail siding on the conventional 1½-ton truck, costing less than $2,000, which is in range of the average small producer's capital outlay.

The 3-axle truck with the two rear axles driving was introduced about two years ago and has proven advantageous for off-the-road travel. The additional set of driving wheels gives greatly improved traction and flotation for woods operation. In the past year an estimated 1,000 military 6 x 6 trucks have been placed on pulpwood operations. Aside from the extreme difficulty in procuring repair parts, these government surplus trucks are very materially aiding us to maintain production. The military 3-axle truck with its increased tracton and flotation approaches the type of equipment which it is believed is needed to haul pulpwood.

Some of the mills have supplemented their wood supply through the use of semi-trailers hauling 5 to 7 cords per load distances up to 80 miles direct to the mill. One specific development of interest is the invention of a semi-trailer with a detachable rear axle assembly, which permits the trailer frame to be stationed in the woods for loading while the rear wheel assembly and truck-tractor is transporting a loaded frame. One load represents 6½ cords, half a freight car load. Another transportation development, for hauls ranging not over 10 miles, involves the use of high-speed wheel tractors to tow rugged pulpwood trailers directly from woods to rail siding.

Our aim in wood procurement is to supply a steady flow of raw product to the mill at a minimum cost of production. Conditions peculiar to the south require that the wood be pulped within a few weeks of the time it was cut. Hence, only small inventories may be maintained. This requires a constant wood production schedule from stump to mill. Mechanical operations show promise in attaining this requirement.

High rainfall, characteristic of the southern region, causes frequent interruptions of truck operation in the woods. The use of logging machinery designed specifically for woods conditions permits more continuous operation approaching all weather logging.

Mechanical operations permit greater stability among labor. Men like to work around machines. Machines are attracting a reliable class of labor into the woods.

Mechanization of logging operations is a definite step forward in forest conservation. Foresters agree that the action of the logging machinery stirs up the forest soil to aid natural reproduction. The power saw already, by its ability to cut a stump near ground level instead of at 12 inches without undue strain on the operator's back, presents the producer with as much as a quarter of a cord per acre of additional wood normally left in stumps.

As a result of ten years of intensive forest fire protection, there are areas where young pines, particularly slash and loblolly, have seeded in so thickly that upon reaching diameters of 2 to 5 inches stagnation is resulting. The pulp mills do not accept this small wood because it lodges in the fins of the barking drum causing break-downs. Development of portable machines to remove the bark at the source is one possibility. Another alternative, one for you to determine, is the utilization of such small wood, bark and all.

Another phase needing exploration is the utilization of sawmill slabs. One procurement superintendent estimates that in Arkansas alone recovery of 1,000 cords a day of slabs for pulp would be possible today if an economic method of barking the slabs at the sawmill were available. Experimental machines portable enough to move and set up with the average semi-portable sawmill are now receiving trials, and it should not be too long until we see through mechanization the turning of sawmill slabwood into the pulp supply.

Our southern pine lands usually have other species such as gum, poplar, and oak interspersed in the stand. Too frequently pulp requirements for pine and lack of outlet for hardwoods has forced us to thin the pine without removing any other species. The result of such practice, particularly in coastal Virginia and North Carolina, is that the less desirable hardwood species are displacing pine. We need a commercial outlet for the recovery of wood of all species that grow on each acre. Perhaps you can give it to us.

We are told that the south's annual growth in hardwood species alone is 7 to 8 million cords, equivalent to our present pulpwood consumption. Good silvicultural management requires the cutting of all species, and the opportunity to remove increased volumes from the stand should reduce logging costs per cord.

New Developments in Pulpwood Procurement on the Pacific Coast

AXEL J. F. BRANDSTROM

The bulk of the pulp industry of the Pacific Coast is located in western Washington and Oregon—an area usually referred to as the Douglas fir region of the Pacific Northwest. In this area, the pulp mills are pretty well concentrated in the Puget Sound district, of which Seattle is the hub, and in the Lower Columbia River District, of which Portland, Oregon, is the hub. Total pulpwood requirements of the mills located in these two districts amounts to about 3 million cords (1½ billion board feet) per year—representing about ⅛ of total U. S. pulpwood production.

Most of these mills were built, or enlarged to their present size, back in the 20's. At that time, there was an overabundant supply of fine old-growth timber available in these two districts. The loggers were operating in old-growth Douglas fir stands ranging from 300 to 600 years in age with dominant trees from 200 to 300 feet in height and from 4 to 10 feet in diameter. Intermingled with these huge Douglas firs were hemlocks and White firs of somewhat lesser size. They were rated as inferior species as far as their use for lumber and plywood was concerned. In clear cutting such stands, however, the best elements of the hemlocks and White firs were usually removed along with the Dogulas fir and other sawlog species. The latter were sent to sawmills and plywood mills while most of the hemlock and White fir logs, averaging about 20 inches in diameter and 40 feet in length, went to the pulp mills. Left behind as woods waste were large volumes of smaller trees,

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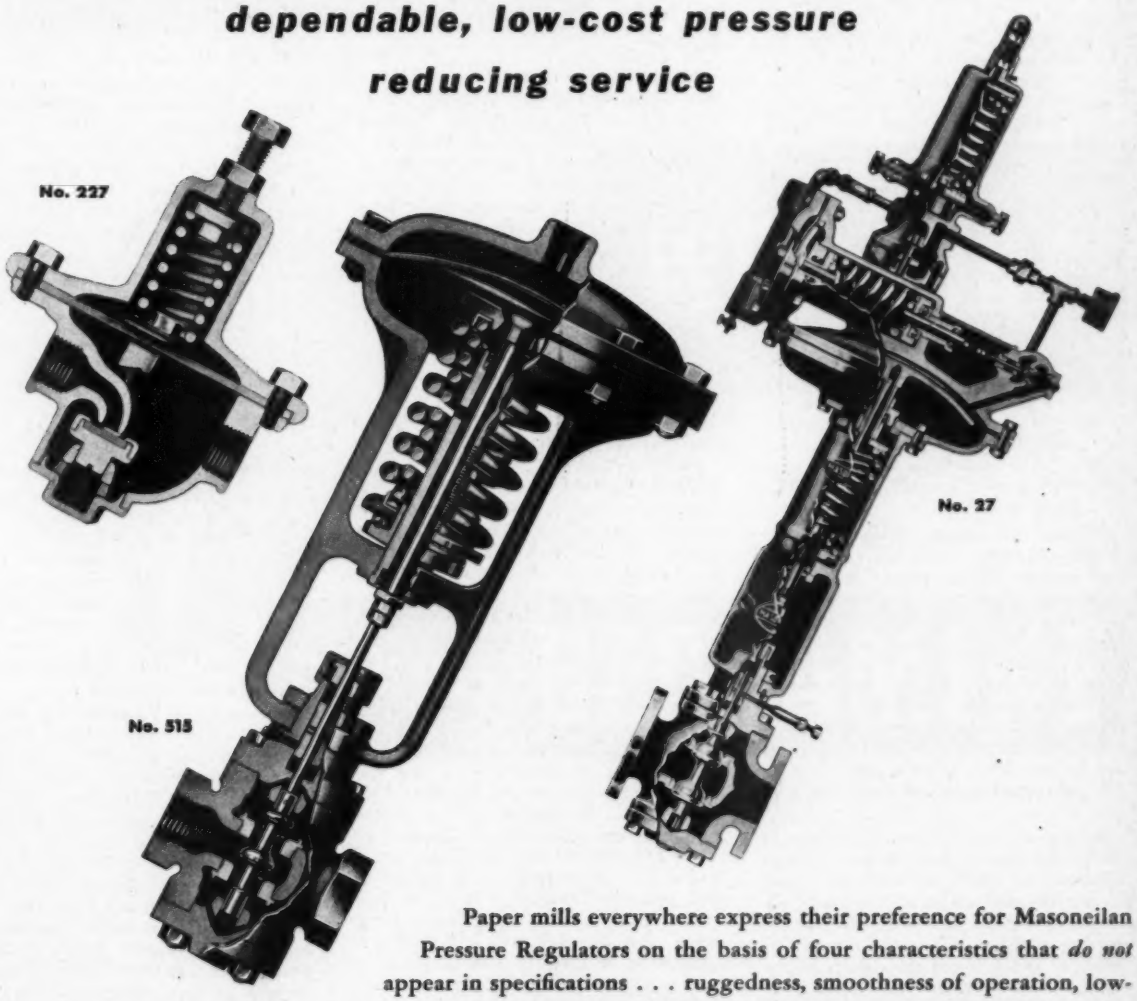

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low grade top logs, broken chunks and tree sections. Thus the logs made available to the pulp mills were, for the most part, of good quality and large size, and they were produced in such quantities that the pulp log market was more or less constantly over-supplied. Priced on a by-product basis and selling as a rule well below the average cost of production, such logs gave the pulp mills a plentiful supply of good raw material at low cost.

This easy raw material situation is now a thing of the past. It came to an end pretty suddenly during the war. As a matter of fact, it would have come to an end regardless of the war, but the war did accentuate and speed up a situation that, under normal conditions, would have come about much more gradually. Depletion of old-growth Douglas fir in these producing districts resulted in a very appreciable shift of sawlog and peeler log production to the vast virgin timber areas of Southern Oregon. The net result of all these developments was that the pulp log supply previously obtained as a by-product of local sawtimber production shrank disastrously. The open log market which for decades had been an outstanding feature of these two large producing districts, ceased, for all practical purposes, to exist. Those pulp mills that had no timber resources or logging operations of their own found themselves confronted with a very serious situation indeed. And even those that had plenty of timber of their own found themselves in a pretty bad shape.

Despite this sudden shrinkage of the normal old-growth pulp log supply, the pulp industry of this region is carrying on pulp production at a higher rate than ever before. This has been accomplished by drawing on new sources of pulpwood and by making fuller use of the raw material at the mills. Closer utilization in old-growth logging, relogging of cutover lands, substitution of other species, operations in young second-growth stands, and improvements in wood preparation in the pulp mills, have all contributed to this end.

In prewar days, old-growth loggers in this region had to leave unutilized large quantities of small trees and logs as well as partially defective and low grade material of medium and large size, simply because such material would not pay its way out of the woods at prices then prevailing. Today, much of this type of material is being logged as a part of the regular old-growth cut. Clean logging of this type is now being practiced in many operations in this region, and particularly in the Puget Sound and Columbia River Districts where much of this material is finding its way to the pulp mills. An outstanding example is the job done since early in 1944 on Crown Zellerbach's Clatsop County operations where wastage of usable material has been reduced to a pretty small figure. The increased yield thus obtained from old-growth stands in operations where clean logging is practiced probably amounts on the average to 15 per cent or so.

Clean logging goes a long way toward full recovery, but experience to date indicates that for a really good clean-up job at reasonable cost, relogging or salvage logging with light equipment and small crews gives the best answer. Salvage operations of this type were started on an experimental basis by the Comox Logging Company in British Columbia over two years ago. Since that time, and especially within the last few months, a great number of salvage operations have started in various parts of the region. Among the larger ones might be mentioned those of the Soundview Pulp Company, St. Paul and Tacoma Lumber Company, East Portland Lumber Mills, St. Helens Pulp and Paper, and Crown Zellerbach Corporation.

Not all of the material coming from these relogging or clean logging operations goes to the pulp mills. A good deal of it is sawlog, mainly Douglas fir. However, one of the notable developments during this war period has been the extent to which some of the pulp mills have started to use our so-called non-pulp species, in prewar days, hemlock and White fir were used almost exclusively not only by the sulphite mills but also by most of the sulphate mills, excepting the board mills. In the case of the sulphite mills, this still holds true. But in the case of the sulphate mills the use of non-pulp species, principally Douglas fir, has increased to a remarkable extent. This is true not only with regard to logs but also with regard to sawmill waste, such as slabs, edgings and trimmings.

A further shift toward increased use of non-pulp species is apparently under way through expansion of pulping processes that can use these species most effectively. The Simpson Logging Company's new board mill which is now under construction at Shelton, Fibreboard's new plant in California, and Weyerhaeuser's newly projected sulphate mill at Longview, are indicative of this trend.

Still another important development is the use of small, immature second-growth. The start of this came over a year ago when Longview Fiber Company announced that they were ready to accept 8-foot second-growth logs—Douglas fir as well as other species—in sizes from 4 inches in diameter and up, at a price of $12 per cord delivered by truck at their mill. That move, really "started something" in utilization of young second-growth in this region. It was only a matter of weeks after the announcement had been made that Longview Fibre Company was getting all the 8-foot logs that it could use; and so was St. Helens Pulp Company, a neighboring mill, which had quickly followed suit. Since then, the movement has spread to several other mills, though as yet in rather small volume due either to lack of facilities for efficient handling of such material at the mills, or to inability to use much Douglas fir.

This young second-growth material has been coming for the most part from farm wood lots or other second-growth Douglas fir stands located as far out as 30 or 40 miles from the mills. Hauling is being done as a rule with small trucks with capacities from 2 to 6 cords per load.

Finally, there are some very important improvements that have been made in wood preparation at the pulp mills. The whole-log hydraulic barker and the whole-log chipper are the principal items here. The first installation of a whole-log hydraulic barker was at the Weyerhaeuser mill at Everett, about three years ago, and soon thereafter Crown Zellerbach Corporation completed installation of one of their own design at Port Townsend. Since that time about half a dozen large mills have been similarly equipped with whole-log hydraulic barkers; and some have at the same time installed whole-log chippers.

The hydraulic barker saves wood previously lost in removing the bark by mechanical means.

The whole-log chipper saves wood previously lost in sawdust, slabs and edgings in sawing pulp logs into cants.

Studies and investigation by various timber owning concerns, as well as by the Forest Service, indicate that the relogging of sound, scalable logs, down to a 6-inch minimum diameter, would add approximately 20 to 25 per cent to the yield from our remaining old-growth stands. On this basis, we have here a potential timber volume of nearly 100-billion board feet (200 million cords) to be added to our present regional timber inventory of 437 billion board feet.

The Kirkland Report, which was published a couple of months ago by the American Forestry Association and the West Coast Lumberman's Association, translates these relogging possibilities into a potential yield of 2 billion feet (or 4 million cords) per year, based on an average recovery of 10 M. board feet (or 20 cords) per acre. This figure of four million cords, then, would represent the extra annual cut that would come out of our old growth stands, if all old growth logging in this region were systematically followed up by relogging.

According to Forest Service estimates only about one-third of this reloggable salvage consists of pulp species timber; the other two-thirds is mostly Douglas fir. However, in the Puget Sound and Columbia River districts the percentage of pulp species is considerably greater. This is significant in view of the fact that practically all present pulp mills are located in these two districts and draw their pulpwood supply from forest areas more or less directly tributary to these districts. In the Southern Oregon district, the percentage of pulp species is pretty small and in this district there are no pulp mills at present. The bulk of the potential salvage material would probably go to existing sawmills or to small portable sawmills which are now coming into the picture on that area in large numbers. Any appreciable use of this salvage for pulp is probably contingent on the construction of sulphate mills within this operating district. As to the feasibility of such developments from the standpoint of water supply, stream pollution and other factors, I do not know.

The Kirkland report, to which I have already referred, shows that we now have in this region six million acres of young second growth stands, about forty years and over in age. Of those, according to

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Kirkland, three million acres are stocked densely enough to require periodic thinnings, whereby current mortality losses averaging about one cord per acre per year, can be prevented. The report also shows that approximately 100,000 acres of oncoming second growth stands are moving into the 40-year age class each year. In these stands, according to Kirkland, initial thinnings averaging 20 cords per acre, should be taken in order to put these stands into condition for proper stand development.

On the basis of these findings, Kirkland shows a potential yield from thinnings totaling five million cords per year. This, then, would represent a gain of five million cords per year over and above the yields obtainable under a management program, where no thinings are taken. Like the relogging material, this extra yield is free for the taking as far as the region's sustained yield cutting budget is concerned.

Regardless of what may come out of these possibilities, the pulp industry can obviously look to these young stands for substantial quantities of pulpwood. However, the way things are now developing, some really tough competition for this young stuff may come from operators of small portable mills. This is a development that has come about within the last few months and, the effects are already being felt very keenly by certain pulp mills which thought that this small-log field was beyond the economic reach of small-mill operators.

New Developments Relating to Improved Methods of Pulpwood Procurement—Lake States—1946

J. W. McNUTT
Chief Operator, Woodlands Dept.
Kimberly-Clark Corporation

Power saws have not taken hold in the Lake States. They have been tried rather widely, and on some operations they are in use now. In general, they have worked well or at least better where the ground is firm, and that situation obtains more frequently under jackpine stands where ground conditions do approximate those in the south. Researchers in general have concentrated on two-man chain saws, gasoline-powered and weighing eighty to about one hundred and ten pounds. To a lesser degree, they have attempted to meet the requirements of the operator of black spruce swamps, but since most of the black spruce swamp pulpwood consumed in Lake States mills originates in Canada, it is logical that Canadian manufacturers should have devoted more attention to that problem. Two Canadian models, the Industrial Engineering "Beaver" at 35 pounds and the Precision at 38 pounds, have been tested thoroughly. Their high cost, in the neighborhood of four hundred and fifty dollars in the United States, has tended to discourage any but the larger companies from experimentation with them.

In the United States, the Reed-Prentice Corporation makes the 52-pound Timberhog which is also labeled a "one-man saw." Still other manufacturers build power saws all the way up to 75 pounds which they designate for one-man operation. There are conditions on landings or other concentration points where such heavy units may serve as "one-man saws" but the requirements of the logger in black spruce swamps are such that any machine exceeding forty pounds in weight is no longer a one-man saw. The problem of combining light weight with high power and high productive capacity involves high rpm. Usually high rpm and light weight mean low durability, and these saws which meet the light weight requirement do not operate day in and day out without breakdown. At this point, it may be stated that no one has yet developed a one-man power saw for use in the woods which will stand up under ordinary working conditions. Now, on the other hand, there have been developed a number of chain saws for two-man operation which are being operated today at a number of points throughout Minnesota and Michigan on landings or points of concentration to which tree length pulpwood has been skidded. The necessity for confining these one hundred pound saws to such landings leads us to a consideration of a logical concomitant—tree length logging.

The conventional method of producing and delivering pulpwood is to cut by axe and buck saw and to pile or bunch 8-foot lengths along the sides of a strip road, the strip road being prepared by the same pieceworker who cuts the pulpwood. These piles or bunches are then loaded by hand on to horse or tractor drawn drays, in summer or winter, or, to a lesser degree, by handloading and sleigh hauling in winter. This prehaul may average anywhere from ⅛ mile to 1 mile and there may be many minor variations in technique. At the end of the prehaul, the wood is unloaded, again by hand, and piled in stock piles, usually four feet high.

This general procedure is still the most widely used in the lake states. Often it is modified by the direct transfer of all or part of the wood by jammer or crane from the drays or sleighs to trucks or trailers, but in the great majority of instances the loading of the drays in the woods is a hand operation.

In general then we may say that methods have not changed much on this phase of the operation since the first pulpwood was produced in this area, and that where mechanical power has been applied, it has usually been to the unloading of the drays or sleighs to stock piles or to trucks at the truck road.

The third step in the delivery chain is, of course, to load this pre-hauled stock-piled wood to either bob-tail (without trailer) trucks or on trucks and semi-trailers. At least 90 per cent of this work is accomplished mechanically by crane or jammer.

Our observations of the final truck haul lead us to the conclusion that it is local custom and tradition which determine whether trailers are used or not—not the requirements of the particular job. Since a very large part of this work is done by trucks owned by small jobbers or owner-operators, the truck used must be such as to best serve the owner's over-all summer and winter needs.

To generalize is always dangerous and so, rather than leave the impression that all operators have remained wedded to such antiquated methods as are above described, it would be well to mention briefly those few, usually larger contractors or company camp operations, which have successfully integrated the pre-haul and the final or truck haul to rail point, so as to avoid stock-piling after pre-haul. In these cases, there is a direct transfer from drays to truck trailers using either jammers with slings or cranes with pulpwood grapples or buckets. Some operators too have elaborated on this technique by packaging each dray load (¾ to 1 cord) with two sling chains, transferring these packages by jammer to truck-trailer at end of pre-haul and again in the same packages from truck-trailers to open top cars, at which point the slings are tripped and the packages broken open.

Even where the above methods are in vogue, we have not yet managed to eliminate the hand loading of the dray before the pre-haul. That one operation remains unmechanized on all lake states operations except on a restricted experimental scale. There are two approaches to the problem. We may mechanically load the wood on the piece-cutter's strip on the drays, in some cases sleighs, in 8-foot lengths, or we may delay the bucking into eight foot lengths by using the tree length skidding technique referred to briefly above. Thus far, the tree-length procedure seems to hold forth far greater promise. To skid tree lengths, there must be a footing for the skidding tractor so that the areas skidded must either be highland reasonably free from swamp, or we must concentrate our operations during the freeze-up months. The latter is what the logger wants to avoid since it usually raises his labor peak to excessive heights—so when tree length skidding has gained wider application it will likely be applied most frequently to highland areas where in any case the average tree is larger than the average swamp black spruce and hence more economically handled. Furthermore the presence of poplar, birch and other hardwoods on these highland areas makes the cutting of the usual strip roads unfeasible and therefore invites this practice.

Experimentation to date seems to favor the use of arches or sulkies, and in some cases skidding pans, as a means of avoiding obstructions with the front ends of the tree lengths.

On arrival at the concentration point, the bucking of the tree lengths into 8-foot or other desired lengths and the loading of the bucked wood onto truck-trailers is readily accomplished. A number of conveyor-cut-off saw combinations have been developed and of these the Montague loader is perhaps the best known in the lake states. These units are above all extremely mobile. They can be moved from one set-up to another a half mile away and be in operation again in considerably less than an hour. Essentially, they consist of a power feed by live rolls or cable to the cut-off saw situated at the foot of an inclined chain conveyor. From this point, the bucked sticks are con-

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veyed to the truck-trailer by an adjustable height conveyor. As long as tractors and arches can deliver the tree lengths and trucks and trailers remove the bucked wood as fast as it issues from the conveyor, such a machine, using just three men, can buck and load 60 to 80 cords per eight hour day. The bucking and loading onto truck trailer of 80 cords of wood by hand methods would require between 20 and 25 man-days. More important still in these times, it has for a year or two been impossible to get men to undertake, at any price, the back bending necessary in the hand-loading of truck-trailers from the ground. Since reduction in man-days is at least as important an objective as reduced costs, it is felt that experimentation in their field is producing most significant results.

While the barking of wood is not usually considered a function of wood procurement, the increasing length of rail haul has revived a consideration of methods of barking before rail shipments, rather than in the drum barkers at the mill. Wherever freight costs have been reduced by the shipment of barked wood, it has in most cases been accomplished by the hand sap-peeling of the wood in June and July. Together with the drastic reduction in man-day output when wood is sap-peeled (about 40 per cent reduction) the method is undesirable because of the increased fire-hazard which it creates and the extent to which it interferes with the natural regeneration of pulpwood species.

It is, therefore, interesting to note that in the next month or so one of the pulp and paper companies in the lake states will be undertaking an experimental combination of the semi-portable Astrom chain barker and the Montague cut-off saw and conveyor. Under this arrangement, the tree lengths with bark on will be skidded to the chain barking machine. Emerging from the barker with bark removed, the tree lengths will be conveyed past the cut-off saw and loaded by conveyor which will drop the barked 8-foot pulpwood onto truck-trailers for delivery to the mill direct or via rail. If such a procedure is found practicable it is easy to visualize immense savings in man-power and freight costs. Following such a procedure, 8-foot peeled pulpwood could be delivered from stump to mill without once having been lifted by human hands. This compares with six such lifts or handlings in the most primitive lake states operations today and either two or three handlings in the average case.

As has been brought out above, many cranes, jammers and other devices have been used for the moving of wood from stock piles or drays to truck-trailers, or from truck-trailers to open top freight cars. The latest of these is known as the Drott Skid-loader. This machine operates hydraulically. Its action approximates that of a chore-boy who uses both arms to enfold and lift an armful of stove wood. It mounts on the front of a tractor of the seven to eight, or the five-ton class. It is one-man operated and, in general, it may be said that it can go wherever a tractor can go—but no further. By virtue of that limitation, the piece-cutters' piles or bunches on the strip-road on soft terrain remain inaccessible to it until frosts render the strip-roads passable. Additionally, the width of the average strip-road does not permit of the maneuvering necessary for the loading of the piece-cutters' pile of wood on the dray. For this reason the Drott, like the tree-length technique is confined either to highland areas or to winter operation if it is to be used in the strip-roads at all. Because of the greater promise of the three-length technique, the Drott Skid-Loader has, to the best of the writer's knowledge, been confined to the loading of trucks from stock piles, in this way performing the same task as the crane and grapple.

Until a year or so ago, the final delivery of pulpwood to rail loading point was carried out mostly by small and medium trucks, 1½ ton to 3 ton. Perhaps half of the trucks were fitted with semi-trailers on wheels and the other half operated bob-tail. A smaller proportion used semitrailers on a single sleigh bob in lieu of wheels and a few operators varied this by using the truck as a tractor and towing one or more sleighs. The combination of a sleigh bob or sleighs in trains was to be found mainly in Minnesota where both conditions and methods naturally more closely approximate those in Canada. Most of the trucks, particularly in the case of the bob-tails, were owned by farmers and other individuals who often used their trucks on highway construction or maintenance during the summer. The larger operators, including the pulp and paper companies operating their own timberlands, were naturally not encouraged to invest heavily in trucks when such a happy condition existed. It was customary then to contract the hauling from stock pile to railway and not to concern oneself too greatly with improvements in truck hauling methods. Both cutting and skidding still resisted mechanization and each of them required more man-days per thousand cords than truck hauling. Strangely, too, in an age of acute labor shortage throughout the industry in general, it was in most cases true that two or more owner-operated trucks offered their services for each job that was available.

Recently with experimentation on other phases well under way, and with the prospect of truck hauls lengthening each year, operators have commenced to study the relative virtues of light, medium and heavy trucks. The trend now is definitely in the direction of heavy units carrying the load on a long body rather than with the aid of semitrailer, and fitted with wide rims and heavy tires, 10.00x20 instead of the 7.50 to 9.00x20 which have been standard during the last five years. The most significant results of the use of these units is infrequent breakdown and low maintenance cost. It is to be expected too that with hauling distances continuing to increase, and as the advantages deriving from the ownership of dependable heavy equipment are properly assessed, the movement toward the use of diesel instead of gasoline power will be accelerated.

No realist counts on cheaper wood as a result of mechanization. His efforts are directed toward fewer but better trained men, each one of whom will work more months per year. Mechanization will prove a means to a most desirable end.

Timber Resources of New England and New York With Special Reference to Pulpwood Supplies

V. L. HARPER, Director
Northeastern Forest Experiment Station

Pulp and paper is the most important of the wood-using industries of the Northeast. In value of product, number of persons employed and volume of wood consumed, it exceeds any other, but like all others it is having increasing difficulties in procurement of timber supplies.

Canada now provides the mills of New England and New York with one-third of the pulpwood that is used. But the pulp and paper industry in Canada has also been expanding very rapidly in the last 40 years. The pressure on raw material supplies is developing there too. The pulpwood forests of eastern Canada are, right now, in the throes of the worst budworm epidemic ever experienced. Millions and millions of cords of spruce and fir timber have been killed. The budworm attack, in progress in Canada since 1938, has now begun in the forests of the Adirondacks.

The 59 Northeastern mills draw their domestic wood from about 42 million acres of commercial forest land. It is of interest to consider this forest area by its four major forest types.

1. The spruce-fir type, most important from the pulpwood standpoint, is located in the northern half of the region and consists mainly of spruce and fir in mixture with hemlock, cedar, pine, and northern hardwoods such as beech, birch and maple. These forests account for nearly 19 million acres of New England and New York's commercial forest area and they supply the bulk of the domestic pulpwood consumed by northeastern mills.

2. Then there is the white pine-hardwoods type that occurs chiefly in lower Maine and New Hampshire and the Champlain Valley of Vermont and New York. These forests account for another 10 million acres. It is from this forest type that mills have recently started drawing white pine pulpwood.

3. The northern hardwoods form a third important type in which some pulpwood is produced. These forests occur over nearly 8 million acres and extend generally through the central portion of New England and New York.

4. Lastly, are the oak-pine forests located principally in lower New England and New York where oak is the dominant wood. This forest type covers about 5 million acres. So far, the timber in these forests has been little used for pulpwood.

The high importance of spruce and fir as raw material for Northeastern pulp is indicated by the fact that these two species constitute more than two-thirds of all the domestic pulpwood (about 2 million cords) used. Their proportion in the

imported pulpwood (about 900 thousand cords) is even higher. Aspen represent about 13 per cent of the pulpwood used about half of which comes from Canada. Hardwoods, other than aspen, make up about 10 per cent. The other 10 per cent is composed of miscellaneous conifers, hemlock, pine, etc. Obviously, it is the spruce-fir stands that are of primary concern as a source of pulpwood supply.

The total volume of the timber stand in New England and New York is about 570 million cords. Of this total, 198 million cords are softwoods and 372 million cords are hardwoods.

There are about 3,500 primary plants in New England and New York manufacturing wood products. Raw material to supply these plants plus that used as fuel wood, fence posts, hewn ties and other round and split wood products involves an annual drain of nearly 11 million cords from the forests of this region. Another million cords are lost in logging waste and 2 million cords more are lost through fires, forest insects, and diseases, and other destructive agents. The total annual drain is about 14 million cords. The commodity drain, that is, the drain for lumber, pulpwood, and other forest products used is about evenly divided between softwoods and hardwoods.

The softwoods, regionwide, are being cut and otherwise taken at a rate of excess of growth. Moreover, a considerable part of the annual softwood growth is in areas remote from transportation and is not always available when it should be cut. A considerable volume of the short-lived balsam fir is not usable for just this reason. It can also be safely said that the growth of the more valuable spruce is being replaced by balsam fir, a species that is more vulnerable to budworm attack. Hardwoods are also encroaching more and more upon the softwoods in the mixed stands.

In short, the excess of growth over drain is in hardwoods. This is the growth that is not now being utilized and it is the material for which uses have been the hardest to find. The pulp and paper industry is, of course, aware of this fact. It has made some progress in expanding the use of hardwoods for pulp.

In addition to the reduction in growing-stock volume there has been serious deterioration in quality. Spruce is giving way to fir and to hardwoods. White pine occupies less space now relative to hardwoods than formerly and the trees are smaller and of poorer quality. A competition between the lumber industry and the pulp industry for white pine timber is now beginning.

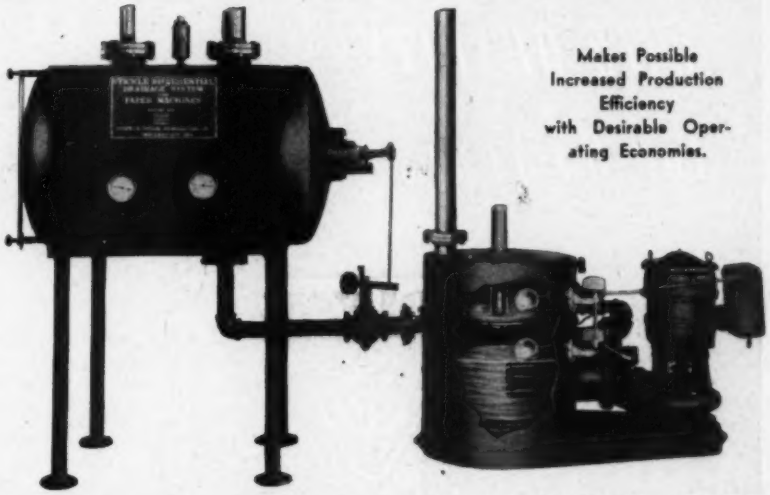
From a regional standpoint the most urgent pulpwood problem is to increase the estimated net spruce-fir current annual growth of some 1,435,000 cords to equal or exceed the present over-all cut of approximately 1,835,000 cords. Thus, there is needed an annual increase of spruce-fir growth of approximately 400,000 cords to bring growth into balance with cut. Another problem is to bring the forest growth to the point where it will meet the future requirements of the industry. Assuming that the present mill capacity (groundwood and sulphite) approximately represents future requirements, an ultimate annual growth of nearly 3½ million cords would be required.

The estimated 1½ million cords annual growth of the Northeast's spruce-fir forests is a far cry from the present mill capacity of 3½ million cords, yet these forests under improved forest practices can be made to supply not only the requirements of established mills but support a substantial allied forest products industry.

Achievement of this goal would involve placing about 19 million acres of spruce-fir producing forests under sustained yield management varying in intensity according to accessibility and geared not only to supply the pulp and paper industry but other wood-using industries dependent on these forests as well.

Although full advantage should be taken of supplementary measures such as expanded use of hardwoods, main reliance for achieving a satisfactory level of pulpwood production must be placed on the application of sound forestry measures. These should be aimed primarily at increasing timber growth and making more effective use of the productive capacity of the land. Briefly, this means the employment of cutting methods which will bring distant overripe stands into an active producing state, stimulate adequate

New STICKLE *Vacuum* DIFFERENTIAL DRAINAGE



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The New Stickle Vacuum Differential Drainage System is designed for paper machines operating at low pressures down to several inches of vacuum. It keeps the dryers free of condensate and air, permitting efficient operation without waste of steam, and with production at high volume. This system eliminates the use of excessive amounts of cooling water or other cooling mediums such as heat exchangers. Required vacuum is automatically maintained and condensate and air are removed at all pressures. Condensate is returned to boiler room at temperature providing an overall fuel saving.

New Stickle Vacuum Differential Drainage automatically maintains the required differential, or drop, in pressure between sections for circulation and for dryer drainage. It also assures accurate modulated temperatures necessary both for quantity and quality production, supplying visible check on drainage of individual dryers and constant information on the surface temperatures of dryers in condensing section. The vacuum pump is an automatic, trouble-free unit, operating on the water-jet principle—simple, efficient, built for long service, without close clearances to wear.

Special Bulletin No. 160-A, supplying more detailed information, will enable paper mill engineers and operating executives more adequately to understand why the New Stickle Vacuum Differential Drainage System is giving satisfaction in mills where it already has been installed. Ask for it.

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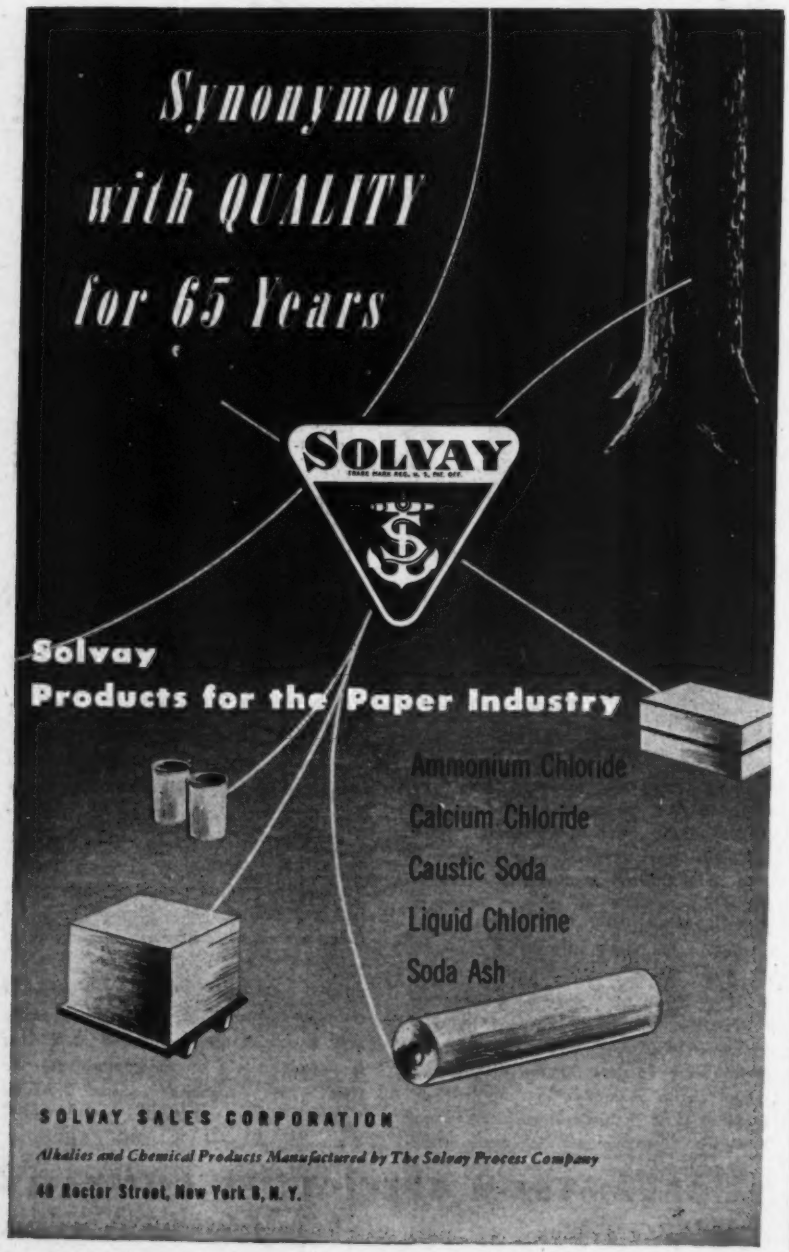
restocking in stands lacking reproduction, insure normal development of advance reproduction where it already exists, create favorable conditions for building up growing stock and increasing the growth rate, and initiate operating cycles which will permit harvesting a greatly increased proportion of the stand's growth.

Better co-operation between pulpwood operators and other industries that can use hardwood logs and bolts should facilitate the removal of more hardwoods. An adequate road system would make it possible to log hardwoods at a low enough cost to assure them of a market. In addition, any development which broadens the utility of these hardwoods or other species for pulp lessens the pressure for cutting the already overcut spruce-fir stands.

The policy which will contribute most to the region's timber supplies, and to its wealth, is to cultivate the growing stock toward a higher level of growth and drain.

The pulp and paper industry can do much to implement such a policy. There are over 10 million acres of forest land in New England and New York that are in holdings of more than 50,000 acres each and most of these are in the spruce-fir country and under the control of pulp manufacturers and pulpwood producers. How these forest properties are managed is their direct concern. The balance of the spruce-fir forest type is in little holdings that belong to thousands of small owners. On these lands the interest of pulp and paper industry is still large although its responsibility for management practices is less direct. An expanded pulpwood market for the lower grade hardwoods would reduce the magnitude of one obstacle to better forest practice on small holdings as well as on pulp industry lands.



Is BTU Accounting Worth While in the Power Plant*

J. E. A. WARNER, Chief Engineer
Robert Gair Co., Inc.

When the ever-increasing cost of fuel is considered in conjunction with the keen industrial competition which undoubtedly lies ahead, it is incumbent on us, as engineers, to accurately know the energy in, and the cost of such energy, delivered by the steam plant to power and processes, also the further distribution of this steam energy and its cost, as between power generation and process.

It may be argued that costs are the prerogative of our accounting departments and as such are not the responsibility of engineers. While it is true that most items entering into the over-all power plant cost, can readily be accumulated and allocated by the usual accounting practices, such as: fixed charges, operating labor, supplies, repair material, and labor; it is when the proper distribution of fuel cost is reached, the accountant is in difficulty and is dependent on the engineer for proper distribution. If in this distribution, we as engineers are not prepared to co-operate with the accountants, we must be satisfied to accept incomplete cost figures, since the cost of fuel is generally a very appreciable part of the total cost of steam and power generation, and accurate segregation of costs cannot be obtained without the proper allotment of fuel cost.

In the steam generating process, the fuel energy is dissipated as follows:

1. Generation of steam *delivered* to power and the manufacturing processes
2. Power and other energy utilized by the steam generating equipment in the process of generation
3. Losses

It must be borne in mind, in this process it is only the energy delivered to power and the mill process for which steam generation can take credit, and the efficiency of this process must be evaluated on the basis of the energy delivered, as compared to the total energy input to steam generation, from both the returned condensate and the fuel consumed.

In the power generating process, the initial steam energy is dissipated as follows:

1. Generation of electrical power
2. Generation of mechanical power
3. Losses of condenser, leakage, radiation, and mechanical and electrical losses
4. The residual energy in exhaust steam delivered to process by the prime movers, after power generation

(*) Abridged from paper presented at the TAPPI Engineering Conference held in Milwaukee, Wis., October 2-4, 1946.

In the power generating process, the ideal condition exists, when the energy in the initial steam delivered to the prime movers is sufficent to generate the required power with a *minimum energy loss* and deliver to process only the needed amount of energy to satisfy mill process requirements.

The energy required to satisfy mill process requirements is not within the scope of this paper, but it likewise offers a broad field for further investigation in Btu accounting.

In order to measure the energy in the steam and water generated or used, total heat as given by the steam tables must be used, but a base must be established above which to measure the energy imparted to, or taken from the water or steam, at each stage of transformation.

This base is the total heat energy in raw make-up water, as related to the temperature of this water during the period considered.

If, therefore, the average temperature of raw make-up water is 60 Fahr for the period considered, all energy input or output must be measured above the base of 28.06 Btu per pound, when using total heat as given by the steam tables.

It is also necessary that a unit of energy be established for evaluating the transfer, loss, or rejection, as it occurs at each stage in the transformation of energy. This unit, for ease in calculation and because of its close approach to the old measure of performance, namely, 1,000 pounds of steam from and at 212 Fahr, should be 1,000,000 Btu.

The first requirement for proper Btu accounting in the power plant is the availability of proper meters, temperature recorders, and other instruments necessary to measure or make possible a determination of the quantity, condition, and energy interchange taking place in fuel, water, steam, power generation, and losses associated with each stage of energy transformation, this installation must be complete, in order that all the determinations may be carefully measured and recorded.

It must be admitted that in the older mills, where reciprocating steam engines are partially or wholly used for the generation of both electrical and mechanical power, it is very often difficult, due to the pulsating flow in the steam mains, to obtain an accurate measure of flow to these prime movers, even with the best flow meter installation.

In the mills utilizing turbines as prime movers, this difficulty is not experienced and with the proper orifice location in relation to the piping layout, there is no difficulty in obtaining accurate determnations.

The second requirement for proper Btu accounting is the assignment of a properly qualified engineer to collect and record the daily records of performance. This man should be qualified to analyze the records and be capable of detecting unnecessary losses of energy whenever and wherever they occur. He should also be qualified to prepare for the accounting department a balance sheet of fuel energy dissipation, covering the accounting period, from which the accountant can make an accurate distribution of fuel cost.

In the opinion of this author, Btu accounting is of great benefit to the power plant engineer, for the following reasons:

I. In the collection of records, the preparation of flow and balance sheets, the engineer will be made conscious of the location and magnitude of the losses occurring in the power plant process. Such knowledge should act as an incentive for the exertion of every effort to reduce these losses to a minimum, either by a change in operating procedure, or if necessary, a change in equipment.

II. It provides a means of equitably distributing the fuel energy to steam generation, power generation, and steam usage in process. Once this distribution is established, the accountant can then allocate the dollar value of the fuel and thus arrive at a true cost for the various stages of the power plant process.

A true power and steam energy cost is essential before management can justify the savings resulting from capital expenditures, where the equipment to be installed consumes either or both forms of energy.

In conclusion, it is contended that the knowledge, possible savings and the true cost accounting, which result from Btu accounting in the power plant, will more than compensate for the cost of equipment and the time and effort of the engineer required to make this accounting possible.

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NEW EQUIPMENT AND SUPPLIES

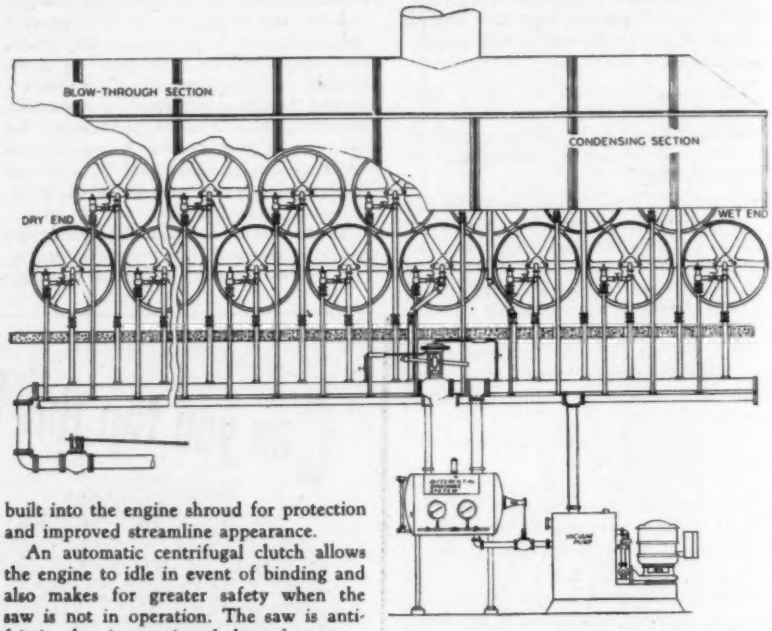
New Vacuum Differential Drainage System for Paper Machine Dryers

Stickle Steam Specialties Company, Indianapolis, Indiana, has announced a new Vacuum Differential Drainage System for paper machine dryers. According to the announcement, the system eliminates approximately 75 per cent of the volume of cooling water, or other cooling medium, required for drainage when the dryers are operating at medium and low pressures or on vacuum. The manufacturer also claims that the system will supply positive and complete removal of all condensate and air at any pressure at which a machine may be operating—whether it is 15 inches of vacuum or 10 pounds of pressure.

The pump used in the system operates on the water-jet principle. It has no close clearances.

Pump control permits continuous operation between any maximum and minimum vacuum setting desired.

Other features of the system include: automatic maintenance of pressure differential between dryer sections of a paper machine for circulation and drainage, visible check on drainage of individual dryers, and continuous temperature readings of dryers in condensing section.



Chain-Type Power Saw

Three sizes of chain saw, each driven by a 4-hp., one-cylinder, two-cycle, air-cooled, gasoline engine, has been announced by Reed-Prentice Corporation, Timber Saw Division, Worcester, Mass. The sizes are: 20 in., for one man operation; and 24 in. and 30 in., for two man operation. The 20 in. saw weighs 52 lb.; the 24 in. and 30 in. saws, 54 lb. and 57 lb. respectively.

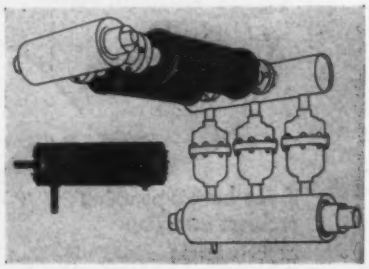
Other features of the saw, in addition to light weight, include a positive fuel injection system which enables a saw to operate at angles of 90 deg. or more without adjustment, and a chain and guide bar which permits accurate setting and locking of saw frame to provide proper tension of the chain. The oil and gasoline tanks are built into the engine shroud for protection and improved streamline appearance.

An automatic centrifugal clutch allows the engine to idle in event of binding and also makes for greater safety when the saw is not in operation. The saw is anti-friction bearing equipped throughout.

The chain cuts a 5/16 in. kerf. Its speed is 1200 fpm. under load.

Pipe Line Heater for Air and Gases

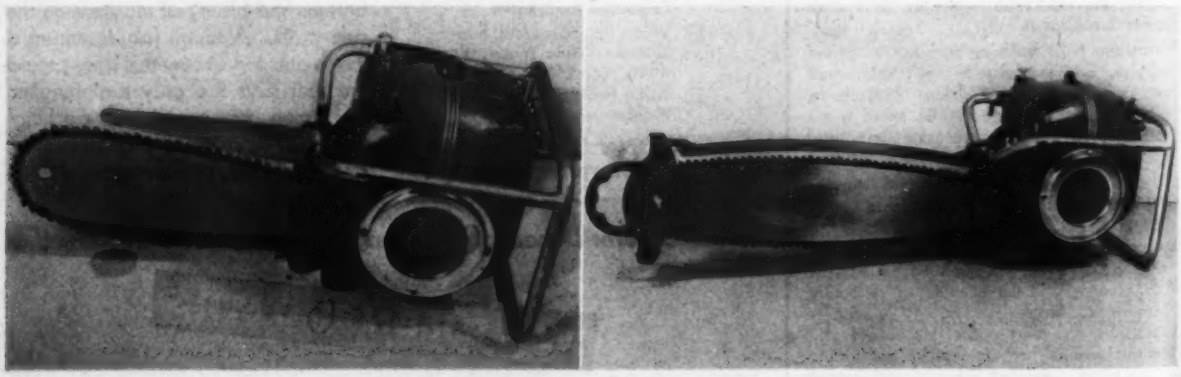
Goodyer Industries, Inc., 224 S. Michigan Ave., Chicago 4, Ill., has announced the *Goodyer Aridizer* as a means for the heating of both air and gases, as well as for the superheating of steam. Electric calrods, or oil or gas burning equipment may be used to effect the heating. According to the announcement, temperatures up to 1000 Fahr. can be maintained with control of leaving temperatures held to within plus or minus one degree Fahr.



New Line of Fungicides

Nuodex Products Co., Inc., 619 Magnolia Ave., Elizabeth F, N. J., has announced a new line of fungicides under the trade name *Nuocides*. The complete line includes both solvent and water soluble types. It includes materials which are microbiostatic in that they arrest or inhibit microbial growth; and others which are microbiocidal in that they destroy the microorganisms. They can be processed, without heating, into ready-to-use preservatives or added in chemical processes.

According to the announcement, casein in any of its industrial uses, such as in paper coatings, is adequately preserved by the Nuocides.



Left: One-man saw. Right: Two-man saw

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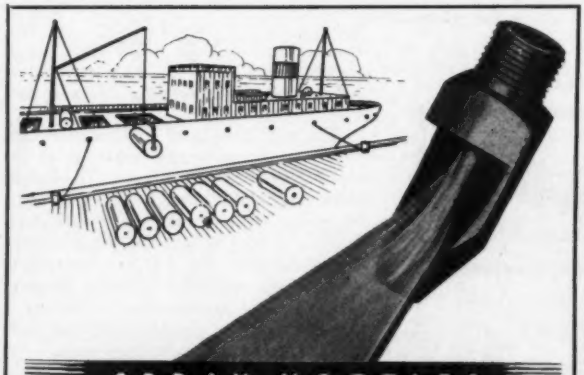

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Motorized Fluid Drive

Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill., has announced a motorized fluid drive which is presently available in sizes up to 20 hp. Designated as the *Electrofluid Drive*, the unit consists of a general purpose motor flange-mounted on a housing containing a fluid coupling.

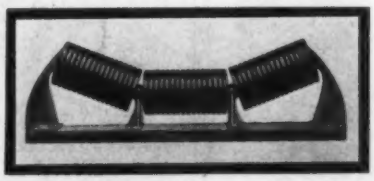
The coupling is filled with a light mineral oil of steam turbine quality. In effect, the fluid coupling serves as an automatic clutch, with the fluid acting as a cushion between the prime mover and the driven machine.

The output shaft of the drive may be connected to driven machine through a chain, gear, or belt drive.

Impact-Cushioning, Troughing Idler

An impact-cushioning, troughing idler for belt conveyors, the Rex Style No. 35, has been announced by Chain Belt Company, Milwaukee, Wis.

Each roll consists of a rubber cylinder vulcanized directly to assembly tube. The



cylinder has multiple grooves moulded into it—deep grooves for maximum cushioning to guard against belt carcass rupture, and shallow grooves to provide surface softness for protection against belt cover laceration.

Each roll is equipped for high pressure grease lubrication, and is regularly furnished with a hydraulic type fitting.

The cushion idler, according to the announcement, should be used to support the belt directly under the loading point—three to four units, spaced at one-half normal idler spacing, being recommended by the manufacturer for an installation.

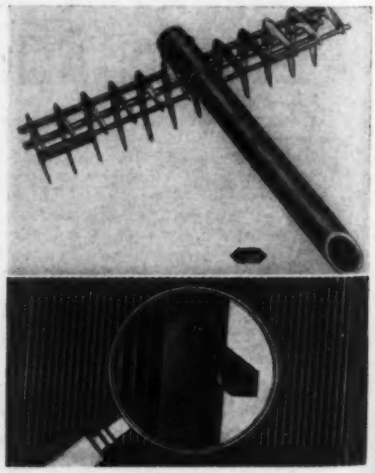
Trash Rack and Rake

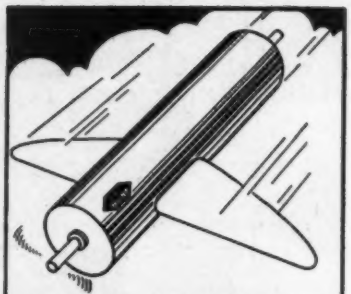
Rodney Hunt Machine Co., Orange, Mass, has announced the development of a new trash rack and rake. Both items are designated by the trade name *Power-Saver*.

The trash rack features an all-welded back bar construction. The vertical slots, spaced by precise jigs and fixtures, are welded into position in such a way, according to the manufacturer, that they cannot bend or twist. The rack can be installed in sections by tank welding, or by clipping and bolting the adjoining back bars.

The trash rake is of stainless steel. Its teeth, spaced to engage the slots of the rack, are of the basket-type. The handle is tubular and is designed to provide a buoyancy air chamber. This self-lifting feature, according to the manufacturer, makes it necessary for an operator to exert only a small pull to bring the rake to the top of the rack for unloading.

Both the rack and the rake are made in variety of sizes to fit every need.





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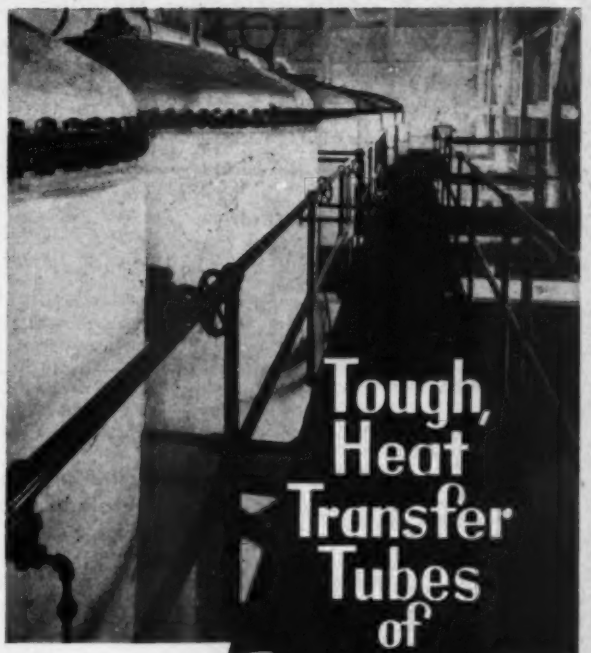

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TECHNICAL DEVELOPMENTS

These abstracts are of the latest developments found in the American and foreign press.

Properties of Pulps and Their Behavior in Making Viscose

The usual characterization of wood pulps does not effectively show whether these are suitable for viscose manufacture. The filterability of viscose solutions is of the greatest practical importance, and a partial fractionation of the pulps takes place during the process, because the more resistant portions of the pulp do not dissolve and are found as insoluble residues on the filter.

The organic components of these non-filterable residues were subjected to study. Pentosan and lignin determinations on these insoluble fractions usually gave negligible results. Because lignin might have been modified during the viscose process and would then no longer be determined in the usual lignin analysis, methoxyl instead of lignin determinations were made, and a micromethoxyl method was devised. This is described.

Strangely enough the methoxyl values of the residues were always higher than was the methoxyl content of the original pulp, pointing to differences in the pulps that are not detectable by means of the usual analytical methods. The methoxyl-containing components of a pulp remain largely in the alpha-cellulose portion, even when pentosans are absent. During the aging process, the methoxyl content decreases with decreasing viscosity. Fractionation of the pulps indicates that the methoxyl-yielding substances decrease with decreasing degrees of polymerization of the various fractions.

The study shows that "foreign groups" other than the usual glucose units are present in the cellulose chains of the pulps. The amount of methoxyl-yielding material does not change on nitration, nor does it change when it is dissolved in cuprammonium solution and reprecipitated. Different cellulosic materials were fractionated by conversion into the nitrates and by fractional precipitation from their acetone solutions. The methoxyl contents of these fractions were determined and their distribution over the various fractions was characteristic for the different cellulosic materials examined.

The fractions with the higher degrees of polymerization (D.P.) invariably showed higher methoxyl values. For various pulps, there is a non-linear relationship between D.P. and methoxyl. For cotton and linters however this relationship is linear, when the D.P. is above 500. There is also a linear relationship between the Tingle bromine number of a hydrolyzed cellulosic material and its methoxyl content. One methoxyl group appears to correspond to two bromine atoms. The sources of these "foreign methoxyls" is discussed, and a new molecular structure for the cellulose molecule is proposed in which the glucose chains are cross-linked by these foreign groups. The authors envision the degradation of cellulose as being primarily due to splitting of these cross-linkages, and then secondarily by fission of the glucose chains themselves. The above are brief abstracts of two articles in German, *I* by T. Kleinert, G. Hingst, and I. Simmler, Kolloid-Z. 108, 137-44, and *II* by Klein ert, Hingst and V. Mössmer, Kolloid-Z. 108, 144-52 (1944).

High-Molecular Wood Celluloses Obtained in Sulphite Cooking

Spruce wood was cooked by the sulphite process using a liquor containing 0.86% lime and 5.95% sulphur dioxide, both on a small commercial scale and in a laboratory autoclave. Samples of pulp were withdrawn at intervals, and these ranged from 25.5% lignin (after a cooking period of 5 hr. at temperatures not exceeding 100 deg. C.) down to 0.9% lignin after a period of 19 hr., with a maximum temperature of about 145 deg. When the mildly-cooked material after 9¾ hours was withdrawn from the commercial digester, this pulp still retained 16.2% lignin and 4.65% pentosans, and showed a cellulose that had the unusually high degree of polymerization (D.P.) of 9000. This was found in the case of nitration with a nitric acid-phosphoric acid mixture, and is probably the highest molecular weight as yet reported for wood cellulose. Nitration and extraction with acetone was more effective than extraction with cuprammonium.

It is estimated that the molecules of cellulose are best represented as slightly folded or undulate unbranched chains and, in the case of the very high molecular weight cellulose, their length is about 0.002 mm. By poly-dispersity measurements, it has been found that the sulphite process probably tends towards a homogenizing effect on the cellulose, when most of the lignin has been removed from the wood. For example, after 14¾ hr. when the lignin content has dropped to 2.4%, the D.P. of the resulting cellulose was 2000, which showed no appreciable change after a further cooking period of 1 hr. At this point too, the solubility in cuprammonium is practically 100%. Nils Gralen and Bendt Ranby. "The Svedberg" (reprint) 1944, 274-287. (Article in English.)

Lignin as Cation Exchanger

The cation-exchanging properties of lignin resins that contain sulphonic acid or carboxyl groups have been tabulated. Thus cation-binding values up to 2 gram-equivalents per 1 kilo of dry resin were obtainable. Active anion-exchangers (A) were formed when alkaline lignin and polyethyleneimines were condensed with dichloroethylmethyl amine. Halogen-substituted lignins are also active anion-exchangers and the introduction of amino groups increases the neutral-salt-splitting ability to as high as 3.7 gram equivalents per kilo of the exchanger.

The most effective adsorbent for lignosulphonic acids is an (A) containing 90% alkali lignin and 10% polyethyleneimine, which adsorbs about 100% of its dry weight of lignosulphonic acid. In general exchangers low in nitrogen are better than those high in nitrogen. The author considers the possible use of this sorbing action in the purification of sulphite waste liquors, freeing them from lignin without sorbing the sugars. The ability of sorbing lignosulphonic acid, increases greatly with the maximum swelling, expressed in grams of water sorbed per 100 grams of the dry exchanger. Lignin-free polyethyleneimine condensation products will sorb the most highly sulphonated lignosulphonic acids. As the lignin content of the exchanger increases, the sulphur content of the adsorbed sulphonic acid decreases. The sorbed sulphonic acid may be eluted with concentrated ammonia or with 5% NaOH.

Although exchangers with a low swelling ability cannot effectively sorb lignosulphonic acids, their adsorbing ability for inorganic or organic acids of low molecular weight remains unaffected. W. Lautsch. Die Chemie, 57, 149-54 (1944) through C. A. 40, 5915 (1946).

Special Thin Parchment Paper

The parchment paper was used for pasting over the surface of metals especially those used in munitions. Thus moisture and air are prevented from contacting the metal. The parchment is about 25 to 30 millimicrons in thickness and highly transparent. It must be free from cracks. Recommendations regarding the manufacture of this type of parchment are outlined. M. I. Uetskii. Bumazhnaya Prom. 20, No. ½, 65-8 (1945) through C. A. 40, 3602, (1946).

Groundwood Studies

The pulps were fractionated by screening and the tensile strength (T), tear resistance (R), wet strength and retention on a hand mold were determined on the several fractions. The product T x R was of interest. Similar tests were carried out with long, short, and fine pulps in admixture, and the ideal mixutre appeared to be 40-45% long, 20% short and 35-40% fine fibers. It was found possible to evaluate a pulp numerically and to express the results of the test with reference to a fixed Schopper tensile test, thereby permitting the comparison of different pulps.

Wood quality is of basic importance. Wood quality decreases with drying, as shown in the case of prolonged drying with softwoods and with poplar and birch. Long soaking (for 48 hours) causes a definite improvement. The influence of pulp stones is very complex. The pulp stone quality contributes to that of the pulp, but (other conditions being constant) the power consumption increases with pulp quality.—J. Vilars. Chimie et Industrie 53, 42 (1945) through C.-A. 40, 2299 (1946).

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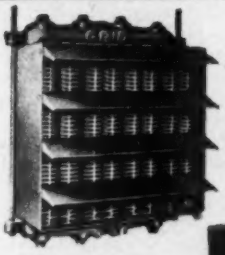

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Greaseproof and Water Repellent Paper

Patent No. 2,380,043. Carroll A. Hochwalt, Rahn Road, Ohio, assignor to Monsanto Chemical Company, a corporation of Delaware. No Drawing. Application August 19, 1942. Serial No. 455,348. 5 Claims. (Cl. 117—154.)

1. A combined grease proof and water repellent paper containing an N-acylated aminobiphenyl where the acyl group is that of fatty acids ranging from C_{12} to C_{20}.

Manufacture of Paper

Patent No. 2,389,254. Maurice A. Goldman, New Brunswick, N. J., assignor, by mesne assignments, to Saco-Lowell Shops, Biddeford, Maine, a corporation of Maine. Application September 27, 1940. Serial No. 358,583. 2 Claims. (Cl. 8—119.)

1. Process of manufacturing paper comprising delivering, unsupported, to pressure rolls a web, having the weight of paper, namely, from about two hundred to about eighteen hundred grains per square yard, of substantially uniformly distributed unattached cellulosic fibers in a substantially dry state, there applying to the web a quickly acting gelatinizing solution adapted to react on cellulose to gelatinize the surface portions of the fiber, and immediately upon application of the solution thereto and before any substantial travel of the web in a wet state compacting the web by pressure, and thereafter suppressing the gelatinizing action of the solution in the web after passage of the web between the pressure rolls.

Paper Pulping Apparatus

Patent No. 2,384,326. Homer D. Martindale, Middletown, Ohio, assignor to The Black-Clawson Company, Hamilton, Ohio, a corporation of Ohio. Application August 27, 1941. Serial No. 408,482. 6 Claims. (Cl. 92—23.)

1. Paper pulping apparatus comprising a tank, a substantially cylindrical screen in the lower portion of the tank providing a discharge chamber therein, a substantially horizontal pulping member rapidly rotatable at high peripheral speed of approximately 2000 to 6000 feet per minute mounted in said tank above the screen in spaced relation with the screen and substantially in axial alignment therewith, said member being vertically spaced a considerable distance above said screen and projecting out beyond the screen and having sharp pulping edges carried upon the upper and the lower sides of said pulping member and arranged in sequential series around said pulping member on both sides thereof with each said edge arranged in a direction generally radial to the pulping member and effective to act upon the narrow zone of the large bodies of pulp above and below said horizontal pulping member to produce a combined pulping action by successively shearing off said comparatively thin layers of pulp from the main bodies of the pulp and to cause outward circulation of such sheared material above and below the member under the high rotating speed and thus to cause circulation of the main bodies of pulp into the paths of said sharp edges for said high speed successively sequential shearing actions, the diameter of the pulping member being about twice the diameter of the screen and the diameter of the tank being about three or more times the diameter of the screen.

Glassine Paper

Patent No. 2,387,429. Paul H. Cate, New York, N. Y., assignor to Kelco Company, San Diego, Calif., a corporation of Delaware. No Drawing. Application October 21, 1940. Serial No. 362,166. 3 Claims. (Cl. 92—3.)

1. Glassine paper comprising paper pulp, glycerine, and substantially 0.3% of an alginate homogeneously incorporated therein to render same oil-resistant and transparent.

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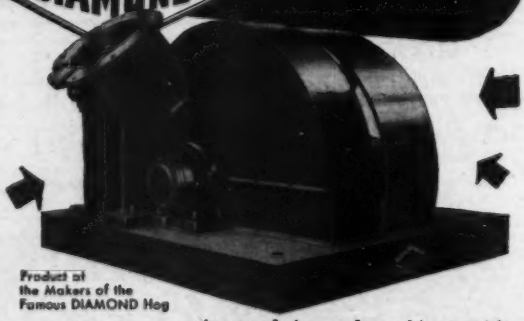

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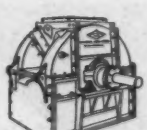

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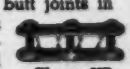

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New Catalogues and Publications

Acme Steel Co., 2840 Archer Ave., Chicago 8, Ill.—New literature covering the use of steel bracing for shipping car doorways is presented in a 4-page illustrated bulletin released by this company. Photographs demonstrating the safe, economical use of the Acme method of protecting shipping loads, accessories, and tools are also given.

American Car & Foundry Co., Valve Department, 30 Church St., New York 8, N. Y.—In the latest ACF Catalogue No. S-46 the additional advantage of manufacturing plug valves in steel is outlined. The booklet contains drawings and dimensional charts which detail the specifications of the valves produced by this company.

Bonney Forge & Tool Works, Allentown, Pa.—A 20-page catalogue issued by this company contains application information, structural data, installation procedure, temperature rating charts, specifications, and price listings of fittings for making full pipe strength, leak proof branch pipe outlets. Illustrations and other descriptive matter catalogues drain out fittings and a complete line of flanges.

Brown Instrument Co. (Div. of Minneapolis-Honeywell Regulator Co.), Philadelphia 44, Pa.—Catalogue No. 5902 discusses the New-Matic Remote Transmission Systems which are used in instances in which electrical transmission for indicating, recording, and control of pressure, temperature, flow, and liquid level is neither desirable nor permissible. The 24-page booklet is illustrated and carries schematic diagrams of typical installations. Operating features of the system are fully explained and the component parts described. . . . Catalogue 6707, also issued by this company, describes its rectangular case thermometers and pressure gauges. Vapor, gas, and mercury actuated thermometers and pressure gauges are illustrated and discussed. Cut-away drawings and illustrations featuring design improvements in the Brown instruments graphically show recent developments. . . . Catalogue 15-10 discusses the ElectroniK Strip Chart Potentiometers which are a new development in temperature control and recording instruments.

Duriron Co., The, Inc., Dayton 1, Ohio—A 4-page instruction folder entitled "How to Pack Your Durcopump" applies specifically to this company's own line of corrosion resisting pumps, but the information contained in the booklet is applicable to all chemical or corrosion resisting centrifugal pumps. The pamphlet gives details on the selection and correct installation of the proper packing for each size pump and each type of service. There is information on special stuffing boxes, such as, liquid seal, recirculating liquid seal, rotating liquid seal, and lubricant seal. Slurry problems are also delt with, and the handling of high suction heads.

Elwell-Parker Co., The, 4532 St. Clair Ave., Cleveland 14, Ohio—"Industrial Logistics In Paper," is the title of a recent publication which tells the story in action pictures of modern materials handling methods in the manufacture and commercial use of paper. The booklet is 48 pages in length, printed on 8½x11 sheet-size paper, and presents 147 half-tone illustrations. This is the sixth book in the series bearing the title Industrial Logistics, and was prepared with the co-operation of representative companies throughout the industry. Graphic pictorial presentations show the electric power industrial trucks at work in the production of pulp, in the processing of paper, in the distribution of paper, in the printing and publishing industries, and in the fabrication of principal paper products. Visual evidence of the jobs accomplished with this materials handling equipment is given, and characteristic similarities are noted in many industrial practices in the paper industry for the movement of material from receiving, through storage, processing, and shipment; however important differences which apply to other industries are denoted.

Foxboro Co., The, Foxboro, Mass.—In Bulletin 277-1, a new 36-page publication entitled "Pneumatic Control Valves and Controller Accessories," this company's familiar valve catalogue is revised and up-to-date material is added. A color page showing the various identifying finishes offered on Stabilflo Valves which follow the color code of the American Standards Association is featured in the booklet. Specification tables for control valves are given, and an appendix containing information on computing valve size is added.

Goodrich Chemical Co., B. F., 324 Rose Bldg., Cleveland 15, Ohio—This publication is a 12-page self contained Glossary of Chemical Names, Terms, and Phrases used in the plastics and rubber industries. It is available on request.

Lewis-Shepard Products, Inc., Watertown, Mass.—"Put Your Business On Wheels" is the title of a catalogue published by this materials handling company. Descriptions and illustrations of the various type of handling devices for industry are given in the booklet.

Mine Safety Appliances Co., Pittsburgh 8, Pa.—A new bulletin lists and describes an assortment of eye protection equipment for every application. Chippers' goggles with protective lenses, chemical goggles, spectacles with screen and leather side protection, dust goggles, welders' goggles, and many other types are presented with appropriate data concerning each.

National Technical Laboratories, 820 Mission St., South Pasadena, Calif.—In a series of bulletins Beckman pH Indicators, electrodes, and accessory equipment are catalogued. Questions concerning pH control are answered with editorial material, diagrams, and specifications in Bulletin No. 16; Bulletin No. 86-B gives price listings and further descriptive matter; Bulletin No. 93-B also gives pertinent data. Bulletin No. 70-A is an information form which will aid in solving plant problems when submitted to the National Technical Laboratories.

Peerless Pump Div., Food Machinery Corp., 301 West Ave. 26, Los Angeles 31, Calif.—A new 20-page bulletin is devoted to the description and illustration of the specialized application of Peerless Turbine Pumps to industrial, municipal, engineering, and agricultural installations in which short pump settings are encountered and in which there is a necessity for deep well turbine pump power. Cut-away views of pumps manufactured by this concern are included in the booklet, together with diagrams of suggested installations for various services. Photographs, details of pump engineering, construction, and operation are also given. The bulletin is identified as B-159.

Preformed Wire Rope Information Bureau, 520 N. Michigan Ave., Chicago, Ill.—Results of a survey carried on by the Bureau in conjunction with ten wire rope manufacturers have been published in a booklet entitled "Wire Rope Users Are Speaking of Preformed." The answers to questions asked the users of wire rope are outlined in the pamphlet. The questions asked involved the factors regarding the economy of using wire rope, wire rope life, reduction of accidents, advantages in use, and inspection procedures followed. The answers to these questions are of interest to all users of wire rope.

Ryerson & Son, Joseph T., Inc., P. O. Box 8000A, Chicago 80, Ill. "How to Pour Bearings" is the title of an illustrated wall card recently published by this company. It is obtainable by writing any of the Ryerson plants. Six cartoon type pictures outline the steps necessary to secure good, tightly lined bearings making the procedure clear and easy to follow.

Springfield Boiler Co., 1965 E. Capitol Ave., Springfield, Ill.—Just released, a 12-page bulletin published by this company details information on points to be considered in selecting boiler plants and the new line of standard boilers manufactured by Springfield. Characteristics and features of the boilers together with operational diagrams are included in the booklet.

Books

Contribution to the Physics of Cellulose Fibres—Written by P. H. Hermans and presented as Communication No. 21, from the Institute for Cellulose Research of the AKU and affiliated companies (Utrecht, Holland), this book, published in English, treats of the experimental investigations carried out by the author and his co-workers, for the most part, during 1943. After covering the general theoretical background of this research and a survey of the fibre material used, the text treats of: Studies in Sorption; Studies in Density; Studies in Refractive Power and Double Refraction; and X-Ray Studies on Orientation. All of this material which makes up most of the volume of more than 225 pages appears in what is designated as the Theoretical Part of the book. The remaining pages relate to the experimental procedures of the investigations and are designated as Experimental Part.

The book appears as one of a series of monographs on the progress of research in Holland during the war. Its publisher is Elsevier Publishing Co., Inc., 215 Fourth Ave., New York 3, N. Y.; its price, $4.00 a copy.

Emulsion Technology (Second, Enlarged Edition)—The work of 21 contributing editors, this edition, totaling 360 pages, has been enlarged over the former edition by the addition of an extensive section on the Theory of Emulsions and Emulsifying Agents. Among the other sections of the work are: On the Mechanism of Emulsification, The Fundamental Principles of Practical Emulsion Manufacture, Emulsion in the Patent Literature, Industrial Emulsion Formulation, Effect of the Mode of Preparation on the Dispersion of Soap-Stabilized Emulsions, The Stability of Emulsions in Thin Films, Rubber Latex, and Some Physical Properties of Dispersions of Asphaltic Bitumen. The book, published by the Chemical Publishing Co., Inc., 26 Court St., Brooklyn 2, N. Y., is priced at $6.50 a copy.

International Trade Handbook—This paper-covered, 100-page publication is designed as a guide for gathering information on international trade, in making decisions of policy in matters of foreign trade, and in making plans for engaging in foreign trade. The text is divided into two major parts. Part I includes information on export for the manufacturer; Part II, information on import for the manufacturer, wholesale distributor, and retailer. An appendix lists abbreviations commonly employed by businessmen in the principal trading nations of the world, presents the text of Revised American Trade Definitions—1941, and lists the field offices of the Bureau of Foreign and Domestic Commerce, U. S. Department of Commerce. Prepared by the

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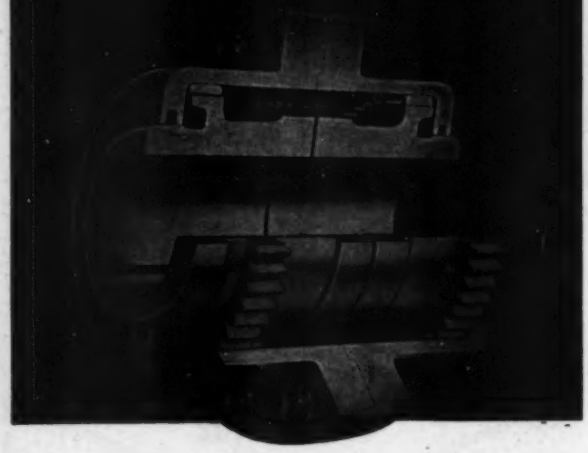

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Lange's Handbook of Chemistry (Sixth Edition)—Compiled and edited by Norbert Adolph Lange, Ph. D., with the assistance of Gordon M. Forker, B.S., this book includes data of a character as indicated by its title on the elements, inorganic compounds, organic compounds, analytical chemistry, physical chemistry and industrial chemistry. There also is an appendix of mathematical tables and formulas by Richard Stevens Burington, Ph.D.

In the publication of this edition of the handbook, a number of the tables in the fifth edition were extended or completely rewritten. Also, subject matter on Modern Concepts of Matter, Numerical Values of the Gas Constant, and Composition of Sea Water has been included for the first time. Two tables in the fifth edition were omitted from the sixth edition to make room for the extension of the revised tables and for the addition of the new data.

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Bound attractively in red Fabricoid cover, with a page size of 5¾ in. by 7¾ in., and totaling 2082 pages, the handbook is priced at $7.00 a copy. Handbook Publishers, Inc., Sandusky, Ohio, is its publisher.

Modern Organic Finishes, Their Application to Industrial Products—This book, in the words of its preface, has been prepared for all industrial users of organic protective and decorative coatings—also, it is primarily a book of methods. In writing the text, the author, Rollin H. Wampler, made use of his own experience and that of his friends and associates, also of books and periodicals listed in the bibliography, and of information furnished by manufacturers of equipment used in industrial finishing processes. The book is divided into six major sections, namely: Modern Organic Finishing Materials (3 chapters); Modern Application Methods (5 chapters); Drying Methods (3 chapters); Product Handling in the Finishing Department (1 chapter); Finishing Processes (11 chapters); and General Considerations (2 chapters). Chapter 16 of the book covers Finishing Paper, Cardboard, and Fabrics. The price of the book is $8.50 a copy; the publisher, the Chemical Publishing Co., Inc., 26 Court St., Brooklyn 2, N. Y.

The Foreman and the Veteran is a digest-sized manual for foremen, supervisors, and department heads which gives concrete suggestions on handling situations arising in the foreman-veteran relationship. The author of the book is Ted Handelman, who in civilian life was an industrial relations expert, and who in the army obtained a healthy perspective of the "GI" viewpoint as an army correspondent. The book can be obtained from the National Foremen's Institute, Inc., Deep River, Conn. The cost is $0.25 per copy.

What Industry Owes To Chemical Science — A symposium based on a scheme by Richard B. Pilcher and Frank Butler-Jones with fifty contributors, issued by Authority of the Council of the Royal Institute of Chemistry (London, England), this book is the first American edition. Among the industries that come in for consideration are: Agriculture; Food; Water Supplies and Sanitation; Pharmaceutical Products; Soaps, Waxes and Glycerin; Disinfectants, Antiseptics and Preservatives; Technical and Other Chemicals; Dyestuffs; Textiles; Pulp and Paper; Synthetic Resins and Plastics; India Rubber; Photography; Coal and Its Products; Heavy Chemicals; Minerals and Metals; Building Materials, Mortar, Cement; and Transport, Shipbuilding and Dockyards. The brief section on pulp and paper is the work of Dr. Julius Grant. Published by Chemical Publishing Co., Inc., 26 Court Street, Brooklyn, N. Y., the book is priced at $5.00 a copy.

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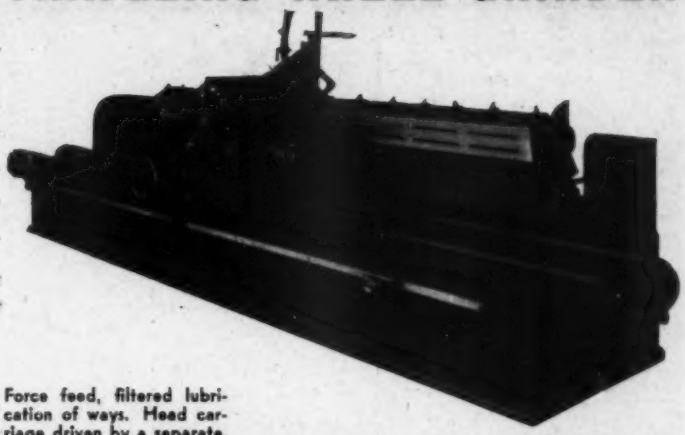

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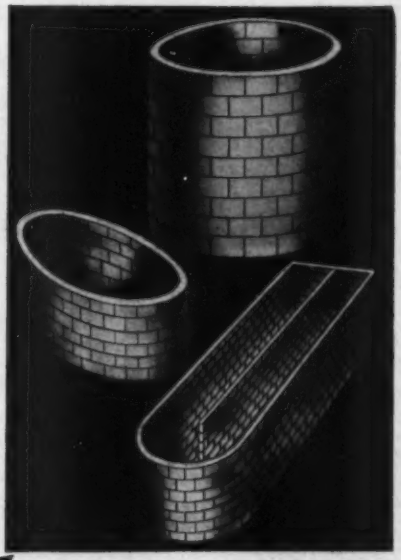

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NEW RAGS

Quotations to consuming mills, cents per pound or dollars per hundred pounds, f.o.b. New York, follow:

(All Prices Are Nominal)

	per cwt.
Blue Overalls	7.00 to 7.50
Corduroy, Men's	4.50 to 5.00
Corduroy, Ladies'	4.50 to 5.00
Washables, No. 1	4.50 to 5.00
Percales	6.50 to 7.00
Light Prints, No. 1	6.00 to 6.50
Khaki Cuttings—	
Bleachable	5.50 to 6.00
Unbleachable	5.00 to 5.50
New White Canvas	9.00 to 9.50
New Mixed Blacks	4.50 to 5.00
Canton Flannels, Bleached	9.50 to 10.00
Shirt Cuttings—	
New White No. 1	10.00 to 11.00
White Shrunk	8.00 to 8.50
Silesias No. 1	7.50 to 8.00
New Unbleached	10.00 to 11.00
Fancy	4.50 to 5.00
Linen Cuttings—	
American	12.00 to 13.00
White	15.00 to 16.00
Grey	15.00 to 16.00

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OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

(All Prices Are Nominal)

	per cwt.
Roofing—	
No. 1	1.90 to 2.00
No. 2	1.80 to 1.90
No. 3 and No. 4	1.70 to 1.80
Twos and Blues—	
Repacked	4.00 to 4.50
Thirds and Blues—	
Repacked	3.50 to 4.00
Miscellaneous	3.00 to 3.50
Whites, No. 1—	
Repacked	5.00 to 5.50
Miscellaneous	4.50 to 5.00
White, No. 2—	
Repacked	4.00 to 4.50
Miscellaneous	3.50 to 4.00

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shopperies	

ROPE and BAGGING

f.o.b. and ex dock New York City

(All Prices Are Nominal)

	per cwt.
Gunny No. 1—	
Foreign	Nominal
Domestic	$5.00 to 5.25
Wool Tares—	
Light	5.00 to 5.25
Heavy	5.25 to 5.50
No. 1 Scrap Bagging	4.00 to 4.50
Manila Rope—	
No. 1 large	6.00 to 6.50
No. 1 small	5.00 to 5.50
Sisal Rope—	
No. 1 large	5.00 to 5.50
No. 1 small	4.50 to 5.00
New Burlap Cuttings	5.50 to 6.00
Jute Threads—	
Foreign (Nom.)	6.50 to 7.00
Domestic	6.00 to 6.50
Strings—	
No. 1 sisal	4.50 to 5.00
No. 2 sisal	4.00 to 4.50
Soft jute	5.50 to 6.00
Mixed	2.25 to 2.75

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

(All Prices Are Nominal)

	per ton
Shavings—	
Hard White Env. Cuts	125.00–
Hard White, No. 1	110.00–
Soft White, No. 1	90.00–
Soft White, One-Cut	100.00–
Soft White, Misc.	80.00–
Fly Leaf, No. 1	45.00–
Fly Leaf, Woody, No. 1	40.00–
No. 2 Mixed Col. Woody	30.00–
Flat Stock—	
No. 1 Heavy Books and Magazines	40.00–
Mixed Books	28.00–
Ledger Stock—	
No. 1 White	65.00–
No. 1 Mixed (Colored)	55.00–
Manilas—	
New Env. Cuttings	90.00–
New Env. Cuts, One-Cut	–
Extra Manilas	–
Manilla Tab Cards, Free of Ground Wood	70.00–
Colored Manilla Tab Cards	55.00–
Kraft—	
New Envelope Cuttings	90.00–
Tripled Sorted No. 1 100%	70.00–
New 100% Cor. Cuts	65.00–
No. 1 Old Assorted	55.00–
News—	
White Blank	65.00–
Overissue	40.00–
No. 1 Baled	30.00–
Old Corrugated Containers	30.00–
New Corrugated Cuts	33.00–
Mill Wrappers	–
Box Board Chips	–
No. 1 Mixed Paper	20.00–

CHEMICALS

f.o.b. shipping point

(All Prices Are Nominal)

Alum (Papermakers)—	
Lump, cwt.	4.25–
Ground, cwt.	4.00–
Powdered, cwt.	4.40–
Blanc Fixe—	
Pulp, bulk, ton	40.00 to 46.50
Dry, barrels, pound	60.00 to —
Bleaching Powder—	
Drums, cwt.	2.25 to 3.10
Casein (Domestic Standard)	
20-30 mesh (bags), lb.	
80-100 mesh (bags), lb. (N)	47.00 to 50.00
Argentine, lb. (N)	48.50 to 52.00
China Clay—	
Domestic Filler Bulk (mine) ton	8.00 to 15.00
Domestic Coating Bulk (mine) ton	12.00 to 22.00
Imported (ship side) Bulk (lump) ton	22.00 to 25.00
Chlorine—	
Tank cars (wks) cwt.	2.00 to 2.25
Gelatine (silicin), lb.	.90 to .95
Glyc. (C.P.) drums, lb.	18.25 to 18.75
Litharge, powd., bbl. lb.	.09¾ to .10¾
Rosin (Gum)—	
New York, per 100 lbs.	
B	8.25–
F	8.77–
G	8.80–
WW	8.82–
Rosin (Wood), carlots	6.00–
Salt Cake—	
Dom. bulk (wks) ton	15.00 to 16.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	20.00 to —
Soda Ash—	
Bulk (works), cwt.	.90 to .95
Paper Bags, cwt.	1.05 to 1.35
Barrels, cwt.	1.05 to 1.35
Soda (Caustic)—	
Solid, drums, cwt.	2.30–
Ground and flake, drums, cwt.	2.70 to 2.95
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.65 to 2.05
40 deg., 35 gal. drums, (works), cwt.	.80 to 1.45
Starch—	
Pearl, 140 lb. bags, cwt.	5.87–
Pearl, barrels, cwt.	5.98–
Paper (Sp.) bags, cwt.	5.98–
Powdered, barrels, cwt.	6.02–
Sulphur (Crude)	
(Mine) bulk, long ton	16.00 to —
Talc—	
Dom. 100 lb. bags (mine) ton	16.00 to 25.00
Canadian	24.00 to 30.00
Titanium Dioxide—	
Barium Pig., bbls., lb.	.05¾ to .06¾
Calcium Pig., bbls., lb.	.05 to .05¼
Zinc Sulphide bbls., lb.	8.25 to 8.50

WOOD PULP

Prices ex dock and f.o.b. pulp mills (dollars per ton) are:

(All Prices Are Nominal)

Foreign bleached sulphite	105.00 to 120.00
Domestic bleached sulphite	105.00 to 115.00
Foreign unbleached sulphite, prime strong	90.00 to 95.00
Foreign easy bleaching sulphite, prime	95.00 to 100.00
Domestic unbleached sulphite, No. 1 strong	85.00 to 95.00
Kraft, standard prime Swedish	90.00 to 95.00
Kraft, bleached, foreign	105.00 to 110.00
Kraft, No. 1 domestic unbleached	90.00 to 95.00
Kraft, southern, delivered	85.00 to 90.00
Kraft, bleached, domestic	100.00 to 110.00
Sulphite screenings, dom.	50.00 to 55.00
Sulphate screenings, dom.	45.00 to 50.00
Soda, bleached, No. 1 delivered paper mills	95.00 to 100.00

PAPER

f.o.b. New York City

(All Prices Are Nominal)

Boards—	
Binders	90.00–
Chip	58.00–
Chip, tube and can	58.00–
Chip, full-blending	60.00–
Chip, egf. mla. lined	65.00–
Coated, white patent .016	84.00–
.020 and heavier	72.00–
Kraft liner	74.00–
Filled News	58.00–
Container	58.00 to 60.50

Book Papers—f.o.b. mill with quantity, weight, manufacturing and other differentials allowed:

Uncoated (Untrimmed)

Book, White (M. F.)—	
A Grade E. F.	–
B Grade E. F.	–
C Grade E. F.	–
D Grade E. F.	–
No. 2 Uncoated Offset 4 sides, White	–

Coated White (Trimmed 4 sides)

No. 1 Glossy	–
No. 2 Glossy	–
No. 3 Glossy	–
No. 4 Glossy	–
C2S Offset	–
C1S Litho (Varnish)	–
C1S Litho (Non-Varnish)	–

Writing Papers—f.o.b. mill with zone, quantity, packing and other differentials allowed:

Rag Content Bond—	per cwt. 20 lb.	16 lb.
Extra 100% Rag	–	
100% Rag	–	
75% Rag	–	
50% Rag	–	
25% Rag	–	

Rag Content Ledger—	per cwt. Zone 1
Extra 100% Rag	–
100% Rag	–
85% Rag	–
75% Rag	–
50% Rag	–
25% Rag	–

Sulphite Bond—	per cwt. 20 lb.	16 lb.
Air dry, watermarked	–	
No. 1 (M.F.) watermarked	–	
No. 2 (M.F.) watermarked	–	
Plain (M.F.) unwatermarked	–	

Sulphite Ledger—	per cwt. Zone 1
No. 1 (M.F.) watermarked	–
No. 2 (M.F.) watermarked	–
Plain (M.F.) unwatermarked	–

Glassine (f.o.b. mill)—	per cwt.
Embossed (25 lbs. up)	–
Bleached (25 lb. up)	–
Unbleached (25 lb. up)	–
Greaseproof—	
Bleached (25 lb. up)	–
Unbleached (25 lb. up)	–

News—	per ton
Rolls, Standard (Contract)	84.00–
Rolls (Spot)	(Nominal)
Sheets	

Tissues (Carlots)—	per ream
White No. 1	1.35–
White No. 2	–
Bleached Anti-Tarnish	–
Colored	–
Anti-Tarnish Kraft	–
Manila	–
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.70–
Napkins, full crepe and emb'sed (12½ lb. to M shts.) per cs.	.70–
Toilet, Bleached (M shts.) per cs.	7.00–
Toilet, Unbleached (M shts.) per cs.	5.50–

Towels—	per case
Bleached	4.00–
Unbleached	3.50–

Wrappings (Kraft)—	per cwt.
Super-Standard	–
No. 1 Wrapping	–
Standard Wrapping	–
Standard Bag	–
Variety Bag	–

Wrappings (Sulphite and Bleached Kraft)— (Rolls, f.o.b. mill)

Bleached Papers—	per cwt.
M.F. & M.G. Waxing, 20 lb. (Carloads only (10,000 lbs.)	–
Drug wrapp., 35 lb.	–

Unbleached Papers—	
Com. Grd. Butch. 40 lb.	–
No. 1 Butchers	–
No. 1 Imit. Parch & Dry Fin. Groc. Sulphite, 30 lb.	–
No. 2 Imit. Parch & Dry Fin. Groc. Sulphite, 30 lb.	–
Steam Finish, 50 lb.	–
Water Finish, 50 lb.	–

Manilas—	
Envp. Mla., Sub. 16-40 (No. 1)	–
Envy. Mla., Sub. 16-28 (No. 2)	–
Envy. Mla. (Prices based on large sheets untrim'd ream-marked, in bdls.)	

Wrapp. Mla. 35 lb. up—	
No. 1	–
No. 2	–

M.G. Sulphite and Kraft (other than Waxing)	
Grade B20 lb.	–
Grade A-22 lb.	–

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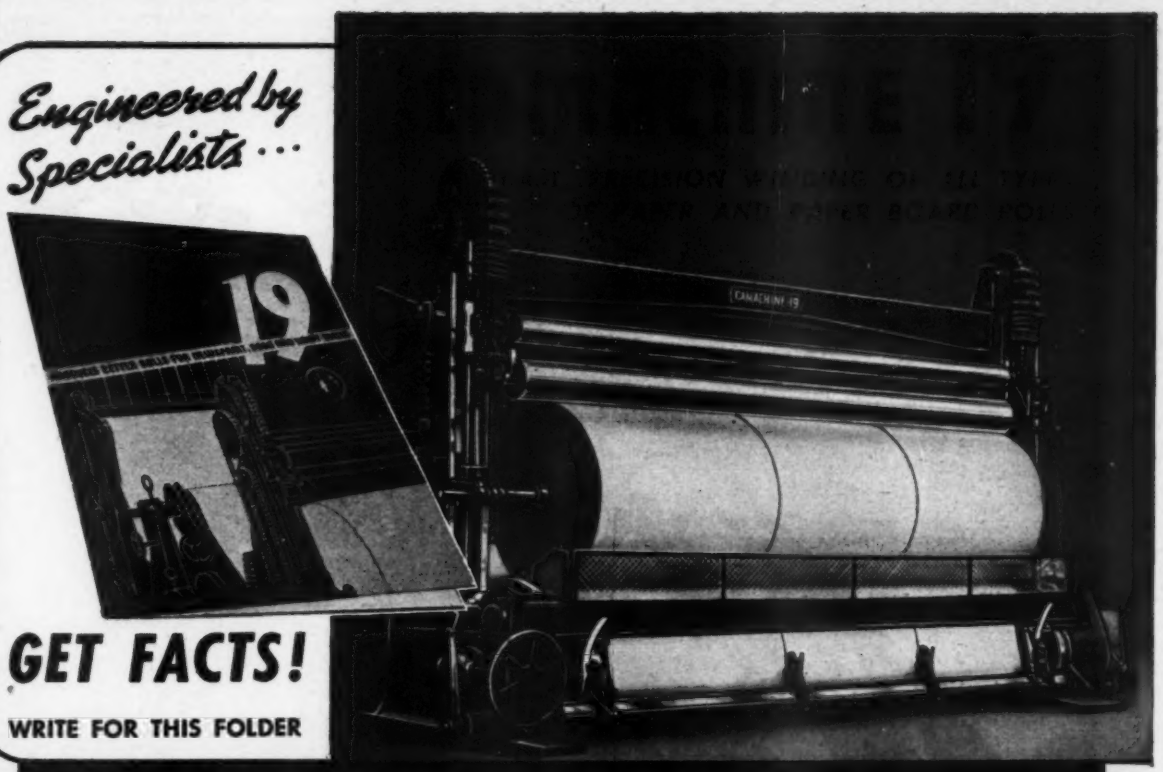

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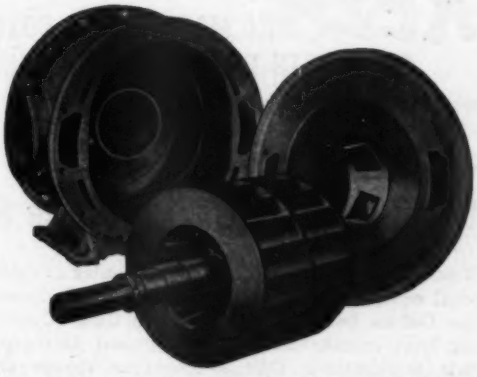

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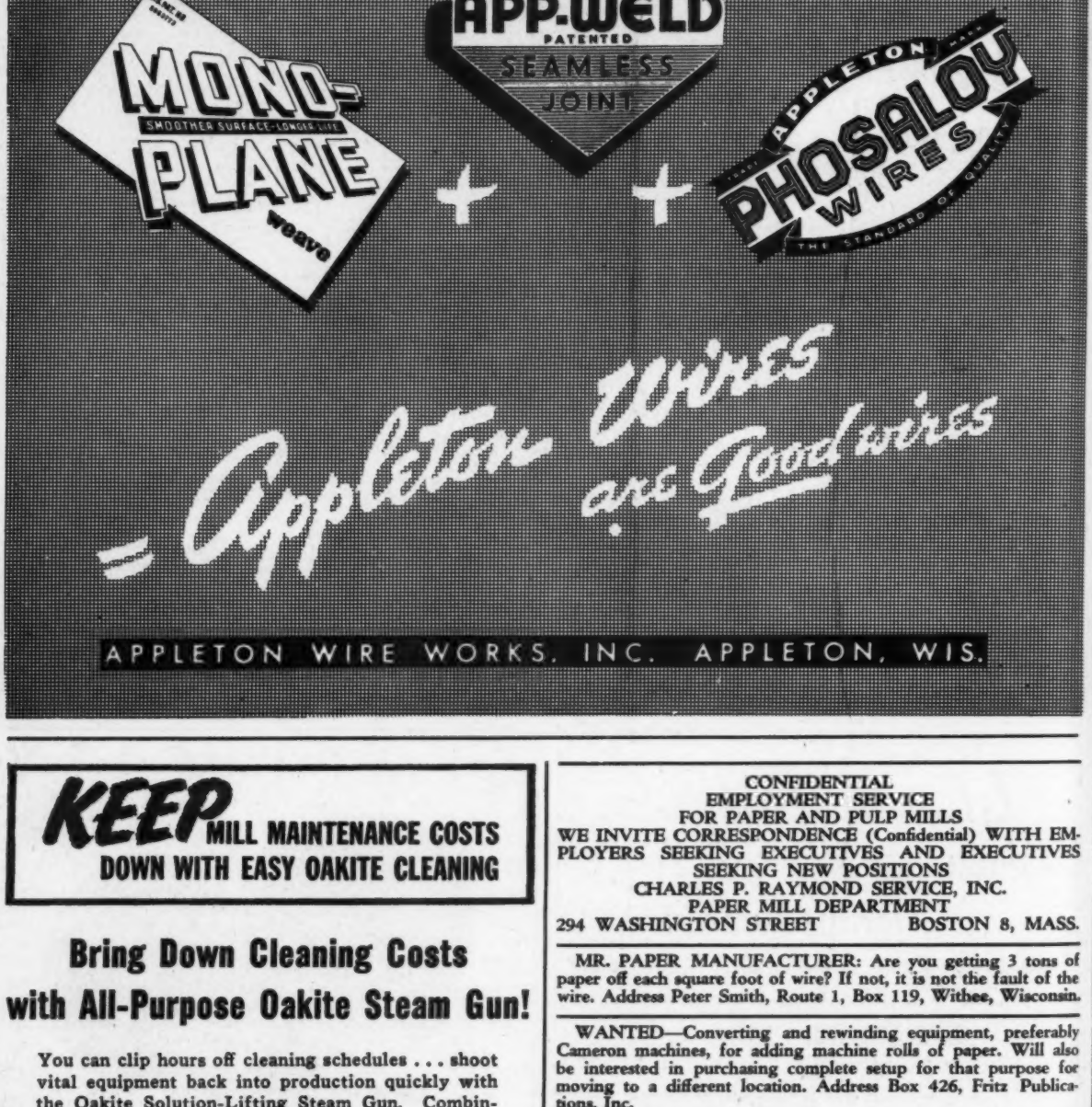

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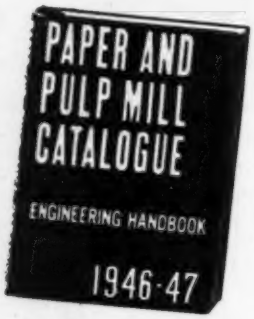

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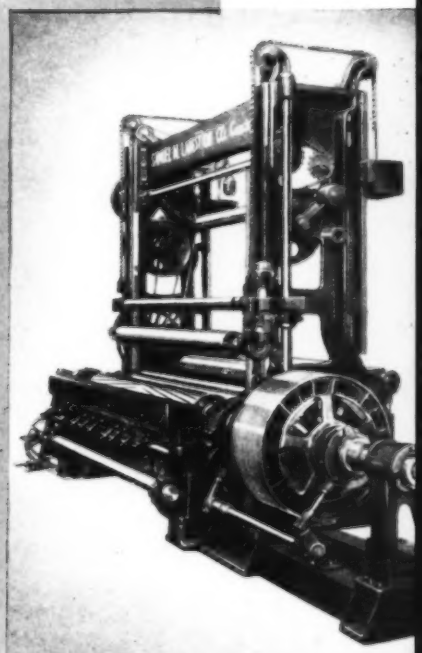

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